

OCTOBER, 1961

# ANNIVERSARY ISSUE

# "AR"



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# Editorial



## THE TOP FIFTEEN

OUR American contemporaries have been blessed or plagued, depending on how one looks at it, with large increases in their Amateur population over the years and consequently are finding their spectrum space becoming more crowded. There has also been a gradual exodus from c.w. to phone, particularly in view of the relatively new s.s.b. type of emission.

In order to partially solve the problem on 20 metres, the F.C.C. in America, on the 10th March, 1960, expanded the phone band from 14.2-14.3 Mc. to 14.2-14.35 Mc. Before the change, U.S. Amateurs used the low end of the band for a.m. contacts with Canadian and DX stations, and the upper portion of the band for s.s.b. contacts with DX using 14.3-14.35 Mc.

The pressure on the F.C.C. for additional phone space on this band has gradually increased since 1946 and was implemented last year to the new frequencies mentioned previously. This decision was not taken lightly but only after very careful consideration of all the factors involved, including the international effects of such an increase. However, the primary concern of the F.C.C. was for their own domestic situation and this eventually decided the position.

We in Australia are fortunate that the P.M.G.'s Department has left the internal working of our allocated bands to the judgment of the Amateur himself in how he uses them. We have endeavoured to accommodate operators using various types of emissions by gentlemen's agreements and generally this has proved satisfactory.

The A.R.R.L. has now seen fit itself to adopt similar means with their new phone allocations on 20 metres to assist and encourage DX s.s.b. stations. Their proposal is that DX s.s.b. stations should operate between 14335 and 14350 Kc. and only work U.S. stations on 14335 Kc. or below. When one realises the pressure in the U.S.A. for greater phone frequencies, this is a most generous gesture on their part.

This proposal will only work if you—the Australian s.s.b. operator—makes it work. No self disciplinary scheme will ever be 100%, but if you observe the following three points, you will contribute towards a habitable band as opposed, as an alternative, to a ruthless jungle of QRM.

The three rules for VK s.s.b. operators are:—

1. USE the top 15 Kc. of 20 metres regularly.
2. WHEN calling CQ announce you will only listen for Ws and Ks on some frequency below 14335 Kc.
3. DO NOT work any W or K station on the top 15 Kc.

W.I.A. FEDERAL EXECUTIVE.

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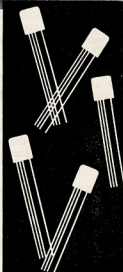
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# OC169 - OC170 - OC171

Transistor Type	OC169	OC170	OC171
Collector Voltage ( $V_{cb}$ max.)	-20	-20	-20 V
Collector Current ( $I_c$ max.)	10	10	10 mA
Max. Dissipation ( $25^\circ$ C)	80	80	80 mW
Typical parameters at (measured at $V_{ce} = -6V$ , $I_c = 1mA$ )	0.45	10	100 Mc/s
	{common emitter}		{common base}
Input Conductance	0.4	2.5	23 mmhos
Input Capacitance	80	65	-6 pF
Feedback Admittance	< 100	100	600 $\mu$ mhos
Transfer Admittance	36	32	14 mA/V
Output Conductance	7	60	350 $\mu$ mhos
Output Capacitance	7	4.5	2.6 pF
Ideal Unilateralised power gain	61	32	< 10dB



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# D.C. POWER CONVERTER FOR MOBILE

A. L. WEST,\* VK5LA

THIS article describes a transistorised d.c. power converter suitable for operating portable or mobile gear from a 12 volt battery supply. It uses a pair of OC28 or OC35 transistors with a saturating core transformer and can deliver a d.c. output power of 70 watts with an efficiency of 82%. At 12.5 volts input this represents a battery drain of 6.8 amps, which compares more than favourably with an equivalent disposals genemotor drag of about 11 or 12 amps. In addition, the transistor device has no astronomical starting current and is only a small fraction of the weight and size of the genemotor.

Most transistor power converters intended to furnish a d.c. output may be classified into two main groups; those which use one transformer and those which use two. The former is the more common and has the great advantages of cheapness and simplicity, while the latter, which incorporates a low powered driver stage, is used where large powers are to be converted or where frequency stability with load variation is desired. The converter described herein uses one transformer only and two power transistors in a common collector push-pull switching circuit.

Of the three basic configurations possible, the common-collector circuit was chosen for two main reasons. Firstly, the transistor base current adds usefully to the primary input, and secondly because the two transistors may be mounted together on a common plate without the need for insulating washers. Because the switching waveform is square, the peak current per transistor is equal to the total average input current from the supply, and the figure of 6.8 amps. mentioned above is clearly beyond the capabilities of transistors of the OC16, 2N301 size. Now available are OC28s and OC35s which, with collector and emitter ratings of 6 and 7.2 amps. respectively, are ideal for the purpose. They are also comparatively cheap. The main difference between them is voltage rating which is not very important in this case, so either will do.

For the transformer there are two possibilities. One is to use a ferrite core and a switching frequency of a few kilocycles; the other is to use an iron core operating at a few hundred cycles. The latter course was chosen as it appears that suitable ferrite cores of adequate volt-ampere rating are not readily available here.

A manufacturer's catalogue was consulted and it was decided to use two C-core loops of 0.004" grain oriented silicon iron strip type HWR 10/8. These have a saturated flux density of 17,000 gauss and an effective cross-sectional area of 0.93 square centimetres for each complete loop.

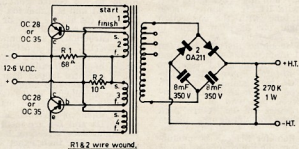
In designing transformers, the following relation may be used:

• The writer explains in clear, concise fashion exactly how to make your own transistorised power supply. Must reading for all mobileers.

Volts per turn =  $4 k B A f \times 10^{-8}$   
where  $k$  = form factor of wave = 1 for square waves.  
 $B$  = flux density used (in gauss) (17,000).  
 $A$  = total effective core area (in sq. cm.) ( $2 \times 0.93$ ).  
 $f$  = frequency of operation (cycles per second) (400).

If 400 c/s. is chosen as the operating frequency one arrives at the figure of 2 turns per volt.

Assuming a battery supply voltage of 12.5 and allowing 1 volt total for transistor knee voltage and transformer resistance drop, the effective primary voltage becomes 11.5. At 2 turns per volt the primary should have  $2 \times 11.5$  or 23 turns.



Now for the feedback winding. To maintain a collector current of 6 amps., a base emitter voltage of up to 1.4 may be required, depending on the individual transistor characteristics. Doubling this to allow a safe margin, it is found that the feedback winding should deliver about 14.3 volts when the primary is energised with 11.5. Thus the number of feedback turns should be about 1.25 times the number of primary turns. Say 29 turns.

The secondary winding will depend on the user's specific requirements and on what type of rectifier system is employed. It is recommended that where possible a full wave voltage doubling circuit be used. This has the advantage of requiring only half as many secondary turns (and silicon diodes) as a bridge system and represents a significant saving in transformer insulation and manual labour requirements. Half wave circuits are unsuitable as they load the transformer unequally on alternate half cycles and result in poor efficiency and uneven load sharing by the two transistors. Because of the square voltage waveform at the secondary, the d.c. output voltage is

an integral multiple of it and if one uses a doubler circuit and 2 turns per volt, then the required number of secondary turns is equal to the desired d.c. output voltage. It is perhaps a good idea to provide a number of taps to allow for different requirements which may arise.

A topic which should be mentioned is overshoot of the switching waveform which increases unnecessarily the all-round voltage stresses and may lead to breakdown. It is greatest at no load and especially with cores which have a poor ratio of permeability to reluctance (e.g. t.v. type ferrite U-cores). The best type of core from this viewpoint is the toroid, but these are rather difficult to wind. With the transformer described overshoot does not present a problem, being 15% at no load and 10% at full load. Bifilar winding techniques are not considered justified in this particular instance.

A word or two about component ratings. With the full wave voltage doubler and square waves the peak inverse voltage experienced by the diodes is twice the transformer voltage, or the

same as the d.c. output voltage. Silicon diodes 0A210 are suitable for outputs of 300 volts or so, while for higher voltages up to about 600, 0A211s should be used. These figures are somewhat conservative and allow for no-load operation and abnormal battery voltages. Clearly the condenser voltage is half the output voltage.

Some forward bias is necessary to start the device and to maintain correct operation at full load. If it is found that the output voltage falls off and transistor dissipation increases rapidly before the rated power output is achieved, then resistor R1 should be lowered in value to correct the condition. The optimum value may depend somewhat on the individual transistors, and whether or not operation at full load is required.

Incidentally, the supply is self-protecting in that if short-circuited oscillation ceases, or drops to a low frequency, the input current falling to a non-destructive value.

When operating correctly the transistor dissipation is low and only a small heat sink is required, while the

(Continued on Page 12)

\*7 Lascelles Ave., Beaumont, South Australia.

# THE ANTENNAMATCH\*

## Part 2—Construction and Use

F. HICKS-ARNOLD (G6MB)

FOR Amateur use, the original circuit devised by Virgil True has been considerably simplified and is now as shown in Fig. 4, an inspection of which reveals that the complete unit is divided into three screened sections, each being further sub-divided so that all r.f. components actually in series with the transmission line are screened from those components which carry d.c. only. The mechanical layout and construction can be seen in the accompanying photograph.

### THE IMPEDANCE DETECTOR COMPONENTS

C2 in the impedance detector section is made up of a 500 pF. ceramic feed-through type condenser with 250 pF. in parallel, making a total of 750 pF. This provides a better by-passing and filtering out of r.f. from the line to D2 whilst performing its original function as part of the capacity divider C1-C2.

The 1 ohm resistor R1 is made up of ten 10 ohm one watt composition resistors in parallel mounted on the outside of a paxolin tube 1" in diameter and 1½" long. The 300 pF. condenser (C13) and D1 (CG6E) crystal associated with R1 are mounted inside the paxolin tube with the connection to R2 brought out at right angles to the axis of the tube. The complete assembly is mounted directly between the co-axial input socket CS1 and the end of the rod forming L1 (see the description of the Phase Angle Detector). RFC1 is a standard 2.5 mH. receiving type r.f. choke directly connected between one end of R1 and earth. It provides the d.c. return path from R1, thus completing the bridge circuit.

The galvanometer M1 can be mounted remote from the impedance bridge as it only carries d.c.; it is decoupled by RFC2, C6 and C7. C4 and C9 are of the ceramic feed-through type, serving both as decoupling condensers and as feed-through connections.

All components other than R1, R2, C4, D1 and RFC1 are mounted above the screened compartment.

### THE PHASE ANGLE DETECTOR COMPONENTS

Inductances L1 and L2 are, in fact, two brass rods. L1 consists of a ¼" rod 5½" long, suspended between feed-through insulators or bushes at opposite ends of the screening box. The diameter of the rod is not critical, although its size will affect the capacity coupling between L1 and L2. The sampling loop L2 is another brass rod ¼" long, which is mounted with the two vertical legs through feed-through insulators in the upper side of the screening box. The horizontal portion is placed above and parallel to L1 to provide inductive coupling to the latter. Spacing between the inductances is approximately 1/16".

General considerations underlying aerial matching and the design and use of The Antennamatch were described by the author in Part 1 of this article which was published in the September issue of this journal.

The legs of L2 are threaded where they pass through the chassis feed-through insulators and are held in position by nuts above and below the insulators. By adjusting the position of the nuts, the coupling between L1 and L2 can be varied as necessary. The centre tap connection to L2 is passed through the upper side of the screening box by means of the 500 pF. feed-through condenser C9.

A rather simpler method of constructing L1 and L2 is to use a 6" length of co-axial cable, terminating the outer copper screening about an inch from each end, with the inner polythene insulation extending slightly beyond the outer screen. Connections are then made to the centre conductor, which acts as L1 and is connected directly into the line (as in the case of the ¼" diameter brass rod used in the first method of construction). The outer screening becomes L2. Such construction has all the essentials of the original, i.e. a length of line forming L1 closely coupled to a centre tapped loop L2. Whilst it is not possible to adjust the coupling, the arrangement works well and is certainly far simpler to make.

All other components, including the diodes D3 and D4, are mounted outside the inductance screening box. As they carry d.c. only, their exact arrangement is not critical but a symmetrical layout is desirable.

CG6E crystal rectifiers were selected for use in the phase angle detector because their high value of back-

resistance made it easier to zero the indicating meters. If only lower back-resistance crystals of the 1N34 type are available, it is suggested that each should be shunted by a resistor of about 220,000 ohms as recommended by the General Electric Co. Whichever type of crystals is used, all should have approximately the same back-resistance in order that a zero output at balance may be obtained.

### OUTPUT SECTION

The output section consists of an r.f. ammeter, a low loss switch and a dummy aerial of 75 ohms impedance.

The r.f. ammeter should have a full scale deflection of about 2 amps. and be of the type having an external thermocouple which can be placed inside the screening box close to the switch. Placing the thermocouple directly in the line carrying the r.f. current introduces as little disturbance of the impedance of the line as possible and permits the meter to be placed remote from the line.

### R.F. VOLTMETER

If such an ammeter with separate thermocouple is not available, an equally useful indication of power output into either artificial load or aerial may be obtained from a simple r.f. voltmeter connected across the line to read the voltage developed. If accurate power readings are not required, the r.f. voltmeter need not be calibrated. Circuit values should be arranged so that power in the artificial aerial, i.e. 75 ohm load, gives about half-scale deflection. Provided the reading when switched to the aerial position is the same, that is all that is required for comparison of power into the dummy load or into the aerial system.

A simple circuit for such an r.f. voltmeter is given in Fig. 5 (g). As large voltages should not be applied to a crystal diode, a resistance network to reduce the applied voltage should be used across the total r.f. voltage in the line. For good linearity of scale deflection when using a 1 mA. meter, the network should be made up of two resistances, the upper one being the line impedance times 100, and the lower being the line impedance times 10, i.e. 7,500 ohms and 750 ohms for a 75 ohm line. This network, together with the crystal diode, r.f. choke and decoupling condensers (1,000 pF.), should be placed as close to the output switch as possible. The lead carrying the d.c. output to the meter can then be of any convenient length without disturbing the impedance of the line or carrying r.f. currents outside the screening box.

### AERIAL LOADING SWITCH

The switch for selecting artificial load or aerial proper should be a low loss type capable of carrying an r.f. current of 2 amps., that used in units of the TU5 series being ideal.

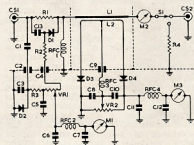


Fig. 4—Complete circuit diagram of the Antennamatch. C1, 10 pF.; C2, see text; C3, 250 pF.; C4, C9, 500 pF. feed-through type; C5, 300 pF.; C6, C11, 470 pF.; C7, C12, 1,000 pF.; C8, C10, C13, 300 pF.; CS1, input co-axial socket; CS2, output co-axial socket; D1, D2, D3, D4, type CG6E crystal diodes; L1, L2, see text; M1, M3, see text; M2, 0.2 A. r.f. meter; R1, 1 ohm (see text); R2, R3, 33,000 ohms; R4, 75 ohms, Morganite type 701 (see text); RFC1, RFC2, RFC3, RFC4, 2.5 mH.; S1, loading switch (see text); VR1, 50,000 ohms; VR2, 250,000 ohms.

\* Reprinted from R.S.G.B. "Bulletin," June, '55.

## ARTIFICIAL LOAD

The artificial load must, as far as possible, have only a resistive element capable of dissipating at least 100 watts. The type 701 heavy duty resistors made by the Morgan Crucible Co. Ltd. are suitable for such use in high frequency circuits as they are non-inductive and have a high surge capacity. These resistors are rated at 90 watts for a rise of 200°C. for continuous loading and can be obtained in exact values from 20 to 2,000 ohms direct from the makers for about 20/- each. However, supplies have been, and are believed still to be, available on the surplus market for a value of 80 ohms—near enough to the required 75 ohms to be satisfactory in The Antennamatch.

Such resistors are a homogeneous mixture of conductors and ceramic bonds and are of their stated resistance at full dissipation rating only. The resistance is somewhat different from the "hot" value; this point should be borne in mind if any attempt is made to check the values of those obtainable as surplus.

The resistor used in The Antennamatch described in this article is mounted externally to the screening box and between it and the front panel. One end is earthed directly to the box by means of a spring supporting clip, the other end being insulated and connected to the aerial loading switch.

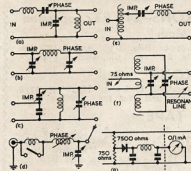


Fig. 5.—Aerial matching networks for independent variation of impedance and phase angle. (a) Cantilever network. (b) Pi-network. (c) Capacitance division. (d) Low-high match. (e) Auto transformer. (f) Link and pi-network for high impedance tuned lines. (g) Simple r.f. voltmeter. The crystal diode should be of type CG66, the two condensers 1,000 pF., and the R.F.C. 2.5 mH.

## INDICATING METERS

Whilst any form of centre zero reading meter of about 100  $\mu$ A. full-scale deflection may be used, there are available on the surplus market very suitable meters in the form of the "Left" and "Right" indicators used with R1155 receivers. These meters have a full-scale deflection of around 45  $\mu$ A. when all internal shunts have been removed.

The type to be preferred is designated Ref. No. 10Q/2—this has two complete movements with two magnets and balance adjustments on both ends of the moving coil pivots. The built-in series and parallel shunts should be removed and connections from the moving coils made direct to the terminals on the back of the case.

Centre marks should be made on each scale with white ink or paint before

adjusting the pointers to these marks by means of the external zero adjusting screws. When this has been done, the complete movements should be withdrawn from the case and the back hair spring tensions adjusted to balance the pressure exerted on the pointer by the adjustment to the front springs. By repeated adjustments to front and back springs, balance should finally be arrived at such that the pointers remain at the centre scale marks with the meter placed in any position.

No attempt should be made to adjust the front springs with the movement removed from the case, as difficulty may be experienced in locating the zero adjusting screws in reassembly if this is done.

## THE SCREENING BOX

The Antennamatch shown in the accompanying photograph is contained in a screening box of 12" overall length, internal screening being provided to form three compartments of 3", 6" and 3" in length, 3" in width and 4" in height. A further compartment extends along the full length of 12" and is approximately 2" in height. The construction can be clearly seen in the illustration and forms a complete and compact unit. The dimensions are not critical but are given as a guide to constructors. The box may be made of 18 s.w.g. aluminium or tinned mild steel.

As can be seen, the unit is mounted on the back of a standard rack panel using stand-off pillars to allow the type 701 dummy load resistor to be held between the panel and screening box. Co-axial connectors are fixed on each end of the box. For ease of component assembly and wiring, the top and back should be covered by removable plates.

## USING THE ANTENNAMATCH

Some form of aerial matching unit in which it is possible to vary both the load impedance and the reactance thrown back is essential in order to gain the maximum benefit from all the information provided by The Antennamatch. Various suitable networks which enable both these conditions to be varied are shown in Fig. 5. The circuits

are suitable for both single ended and twin line feeders. All have been used by the writer with success, but particular attention is drawn to network F, which is very suitable for use with all forms of centre fed aerials normally fed with tuned lines. It permits accurate matching with wide variations of feeder lengths and impedances.

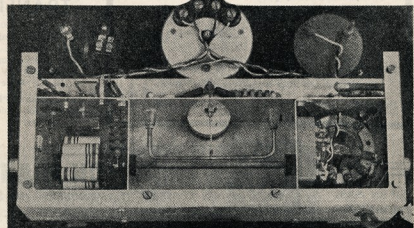
The split coil should be wound on a suitable former with the two halves approximately  $\frac{1}{2}$ " apart. The inner ends are taken to the feeders and are across the condenser marked "impedance". This should have a maximum capacity of approximately 250 pF. in order to cover wide variations of impedance and should have a plate to plate spacing great enough to prevent r.f. arc-over at maximum power and voltage. The condenser marked "phase", connected across the outer ends of the split coil, should be of approximately 150 pF. maximum capacity and of sufficient spacing to prevent r.f. arc-over.

Between the two halves of the split coil and on the same former is wound the link coil which is connected to the transmitter by 75 ohm co-axial cable. The Antennamatch should be placed in series with this feeder. For all bands above 3.5 Mc. a one turn link should be sufficient but two turns may be necessary on 3.5 Mc. to give correct impedance and loading at zero reactance. Separate coils should be used for each band; their inductance must be such that it will resonate at the frequency in use with the feeders and aerial connected.

In operation the transmitter should be tuned up with the output switched to the artificial load with the p.a. loaded to the design figure. Both centre zero meters should be correctly zeroed, after which the output can be switched to the aerial proper.

Simultaneous adjustment must then be made to both the impedance and phasing controls until a point is reached where the aerial becomes resonant and takes power from the transmitter. There will be some interaction between the adjustment of these controls as the correct values are approached but with a little practice one adjustment can be

(Continued on Page 12)



Close up view of the interior of the screening box showing the construction of R1 and L1 and L2.





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# A REFERENCE SHIFT MODULATOR FOR MOBILES

VIC. COLE,\* VK2VL

ONE of the problems in building a mobile rig is the modulation transformer, a good one is very pricey and much too large for a small low-power rig, so with this in mind much time was spent with text books, etc., to find a suitable circuit which did not require a transformer.

One solution was screen-grid modulation, but this method provides a carrier efficiency of only about 30%.

Another was Heising, or choke coupled plate modulation. This is an old and well-tried system where the modulation transformer is replaced by a choke—a common junk box item. However this system has two short-comings. First, since the maximum plate dissipation occurs with no audio input the permissible modulator plate power is limited to the rated plate dissipation of the tube. Second, the maximum plate current swing is severely limited.

A variation of the Heising, called "class K" modulation looked good, an increasing audio level increases the bias on an audio clamp tube and thus increases the modulator screen voltage.

The modulator tube is operated at zero bias so that a high plate current swing can be obtained, but this system requires an extra "clamp" tube and I did not have the space to spare.

On looking through more magazines, etc., I found some information on Reference Shift Modulation. This appeared to have all the advantages and none of the disadvantages of the above systems.

It does not require a fixed bias supply, no clamp tube is required, and the driver tube requires very little power, so a mobile rig was built in a box 6" x 3 1/2" x 5" and has been giving very good results over the past six months.

Reference shift modulation is, basically, bias shift modulation with positive bias, this might seem queer, but it has no ill effects as the modulator tube is operated as a zero bias triode. It is not a new system of modulation but, surprisingly, it is not referred to in many of the well known text books.

The basic reference shift circuit centres around V2B in the diagram which is the driver tube, the output of the cathode follower driver V2B is an audio voltage impressed on a positive d.c. voltage equal to the peak audio voltage. The average plate current of V3 is therefore proportional to the audio input voltage.

The voltage divider R7-R8 applies a fraction of the cathode voltage to the anode of Cr1, output from Cr1 is filtered by C4 and applied as a positive d.c. reference level to the grid of V2B through R6, the resulting increase in reference voltage increases the average cathode current which, in turn, increases the d.c. cathode level. The d.c. output level of V2B thus increases as its audio output level increases.

The modulator tube V3 is a zero bias triode with positive bias, most pentodes will operate under these conditions. This bias is the d.c. output level of V2B and as this is a function of the audio level, the average plate current of V3 is also a function of the audio level, swinging between cut-off and saturation providing a plate efficiency of 50% or more and operating similar to a "B" class system where the plate current is at a low value when no modulation is applied—a good feature in saving a little drain on the car battery.

Driver tube V2B should have a low plate resistance so that a low source impedance is presented to the grid of V3. Tubes that fulfil this requirement are 6C4, 6S4, 12BH7, 12AU7.

Resistors R7 and R8 are a voltage divider, loaded by a relatively high impedance and should not present an appreciable load to V2B, the total resistance should be 5 to 10 times the load presented by the grid of V3.

You can experiment with the values, but both resistors must be equal in value.

Rectifier Cr1 can be any type of diode that has a maximum rated back voltage higher than the reference voltage at the junction of R6 and C4. In my case the voltage varied between +20 and +60 volts so I used a diode with a back voltage of 100 volts rating.

Do not use diodes in series. Two cost more than one and they cannot be depended on to have equal back resistances.

If you wish to try this system in a home rig of 30 to 50 watts, use a valve rectifier.

I used a 12AU7 for V2B because I wanted 12v. filament and had one in the junk box. A 6C4 would work well and the speech amplifier end can be

varied to suit the particular tubes and microphone you have.

Re microphones, avoid if possible the use of crystal types. They are not rugged enough for mobile use. A car can get mighty hot on a summer day. Dynamic mikes stand up well if you want that little extra quality, but the old carbon types are best for reliability. It is surprising the number of times you will bump the mike on the steering wheel or drop it off the seat onto the floor while talking, changing gear and turning a corner—all at the same time.

As I had plenty of gain in the speech amplifier the cathode by-pass condenser was left out of V2A to save some space.

The 6BW6 was chosen so I could series the filaments with the 6BW6 in the transmitter final.

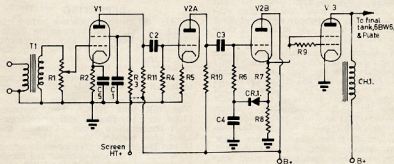
The choke CH1 is 6 henries at 80 mA. You can experiment a bit here, the inductance does not appear to be critical as long as the reactance is equal to or higher than the p.a. plate impedance, and the lower its resistance the better.

While it is not claimed that this system is the answer to all modulator problems, it is simple and will give good results in a low power mobile rig.

## VK-ZL DX CONTEST, 1961

W.I.A.'s. F.C.C. has received numerous criticisms on the lack of VK and ZL stations taking part in this world-wide Contest. So what about it chaps? Give it all the support you can. It needs it!

The rules of this Contest were published in the August issue. The phone section is from 1000 GMT on Saturday, 30th September, to 1000 GMT on Sunday, 1st October. The c.w. section is from 1000 GMT on Saturday, 7th October, to 1000 GMT on Sunday, 8th Oct.



REFERENCE SHIFT MODULATOR.

- C1—0.1  $\mu$ F.
- C2, C3—0.001  $\mu$ F. mica.
- C4—0.005  $\mu$ F. mica.
- C5—25  $\mu$ F. 40v.
- C6—0.5 meg. potentiometer.
- R1—1,000 ohm, 1 watt.
- R2—1 megohm, 1 watt.
- R3—0.5 megohm, 1/2 watt.
- R4—0.5 megohm, 1/2 watt.
- R5—10,000 ohm, 1 watt.
- R6—1 megohm, 1/2 watt.
- R7, R8—47,000 ohm, 1 watt.
- R9—20,000 ohm, 1/2 watt.
- R10, R11—0.25 megohm, 1 watt.
- T1—Microphone transformer.
- CH1—6 H., 80 mA. choke.
- CR1—Diode, 1N35A, GEX45, etc.
- V1—6AU6.
- V2—12AU7.
- V3—6BW6.



# V.H.F.—THE PRESENT STATE OF THE ART

JUST recently there has been a great hue and cry about the lack of news from the six metre boys with regard to activities and the like. How can there be news when there is no activity? What has happened to the exclusive six metre operator of the DX season? Has he got cold feet? Or can't he be bothered with the general friendly ragchew on six metres during the winter?

Of the 60 odd stations I have so far worked on the 6 m band, I can say almost without contradiction that I have worked 10 or so in the last two months. I heard some of them on—the last VK2-VK4 breakthrough. They came on for an hour and have not been heard since. One of them missed the break, had a local contact to find this out and went off the air after that contact. Why? Aren't the local boys on 6 m good enough to talk to? Don't they represent a big enough challenge to the powers of your "wonderful" equipment?

Your only fooling yourself. It only takes a watt to work VK4-2, 5, etc., during a breakthrough. Almost anything with a piece of wire sticking out of it will do for the receiver, but you just try and get that watt through to a local station. That is an achievement. Try a consistent contact over 600 miles, winter or summer! There you are achieving something. Those things will prove your equipment.

Do you bother to listen to anything below a so-called S9? Do you just dismiss it as "he hasn't got his beam in my direction"? How about getting up and turning your beam around, or is that just too much hard work? There are, or so I was taught, four main compass points—N, E, S, W. When you call CQ, call it in each direction; if somebody doesn't come back to you there is something definitely wrong. I would suggest you check your equipment in this case, maybe the converter is at fault. Maybe the noise level is running S6-8. It does here, too, but still the majority of metropolitan stations can get a strength report of S8-9 from here, off the side or back of their beams mind you.

When you do eventually come on the air and call CQ, the call is general and is intended for anybody, so by rights you should answer the first person you hear calling you. This clique habit of tuning the band to see if one of your mates is on is a disgusting practice. If you want to talk to your mate, call him and don't make it a general call.

However, if he doesn't come back, how about making the call general, there are other Amateurs around who may like a contact, maybe waiting for somebody to indicate his presence on the band so that they can try out their transmitter, etc.

Those are my opinions on why, on 6 m, there is lack of interest in 6 m and consequently lack of news. There are, however, a few other points on these v.h.f. bands which are certainly screwy.

## USE OF SIX METRES

We have (had?) four megacycles of band to play around with. On 6 metres we use densely the first 500 kc. The number of stations on 6 m could quite easily fit in the 500 kc, with tons of room to spare. Other than that there are a dozen stations probably whose crystal frequencies put them above this. Is it any wonder then that the P.M.G. want to take away two megacycles of this band? 3,500 kc. of it is virtually wasted space, we don't use it, so why the great hullabaloo over missing 2,000 kc. of it? After all, we still have 1,500 kc. which will not be used. All right, so it's an International allocation, but at least most of the other countries use it. The P.M.G. is not blind, nor is it independent, it must pick up channel space where it can and what better place than the unused portions of the Amateur bands. It's not activity on the bands that will help us keep them, it's using them. When you get given 4,000 kc., for Pete's sake use it or you soon won't have 4,000 kc.

Much the same goes for 2 m, but since I don't use this band I won't say anything.

## SCRAMBLES

These I am getting fed up with, mainly because after one hour total operating time in two of these farces I have a total of eight points, and I can hear nearly every station quite a few db. over 9 (my 9). As I said before, there are four points to the compass, how about listening in each direction or better still put up a turnstile. After all, all my DX has been worked using one of these and I've got and given just as good a report as six elements. The use of one of these antennae may well be the difference between that deciding point where somebody didn't bother to turn his beam. Try it anyway, then everybody has a chance of scoring, not just those with S9 (anybody's) signals.

## REPORTING

This is another practice which is being abused, typical example being: "if I can hear him and understand him, 5 x 9." This does not help the bod at the other end. After all, he was probably 5 x 9 last time but is 6 db. weaker this time. It doesn't cost much to install an S meter in your receiver.

All that is required are a couple of pots (5K and 100K), two resistors (1000 and 100 ohms) and an old aircraft temperature gauge. Connect the 1,000 ohm resistor between HT+ and IF can B+, the two pots in series across HT+ and earth, and connect the meter between the junction of the 1,000 ohm resistor and the IF can B+ and the junction of the two pots. The pot closest to HT+ is the 5K one. The 100 ohm resistor shunts the meter.

To adjust the meter take the particular i.f. tube out and adjust full scale deflection. Put the tube back in, disconnect the aerial and adjust the 5K pot for zero. Decide on your own scale

and stick to it. It at least makes your reports reliable, even if not accurate.

Quality is not an important factor in our transmission, but readability is. There is quite a big difference between the two and also a big difference in the amount of bandspace used, and on the "crowded" v.h.f. bands bandspace is important. Try restricting the top and bottom of the audio range and see if it doesn't make a difference.

Just try a few of these things, that's all I ask. After all, it's what you are allowed on the air for in the first place.

—“One Angry Young Man.”



## HINTS AND KINKS

### PAINLESS MOUNTING OF THE MOBILE ANTENNA

Those keen mobileers who are sometimes dismayed at the thought of drilling holes in the new car, or fitting unsightly brackets at the rear to mount a loaded whip, take heart!

I obtained a 4 ft. 6 in. length of thin walled (1/32 in.) brass tubing, 5/16 in. inside diameter. (Obtainable from Gummerson Allen.) This size slides smoothly over the standard b.c. antenna. At one end is the usual loading coil and a 4 ft. section of brass tubing completes the antenna on top.

A piece of dural tubing was attached to a block of polythene drilled in the centre for a snug fit and the lower section of the whip slides through. The other end of the dural is suitably flattened and drilled for attachment to the side mounting bracket on the sun visor and gives rigidity to the antenna.

The antenna loads normally and may be set up or dismantled and stowed in the boot in minutes.

As my rig (converter and tx) is concealed in the glove-box, the XYL and I are now on speaking terms when Sunday driving!—VK3AHG.

### AN AID FOR YOUR BEAM

I do not know whether the following idea is original or not, but have found it quite effective and easy to construct. It has been in use at this QTH for over 18 months now. The only maintenance being a drop of oil now and then.

The main item is a 4" breast drill which gives a very slow movement when turned by a motor or handle coupled by a shaft held in the chuck. A coupling (water) is welded on to the centre of the main wheel of the drill, into which is screwed the pipe which eventually supports the beam. The weight of the mast is taken by sitting the underneath section of the drill into a slot cut in the top of a piece of 1" or 1½" pipe which is set in concrete at the base of the tower.

The mast here carries a 6 element 144 Mc. and a 4 element 50 Mc. beam, and rotates fully without any trouble.

—C. Abernethy, W1A-L2211.

# THE FRANKLIN OSCILLATOR

ARTHUR J. BOWMAN,\* VK2ASB

THE Franklin Oscillator has long been recognised as one of the most stable v.f.o.s. possible to construct without elaborate precautions against drift, either short time drift or warm up drift.

The oscillator about to be described surpassed all the crystal oscillators the writer has built to check the stability. It even surpassed the Bendix frequency meter.

The unit was built on a chassis 9" x 5½" x 2" with a special box 3" x 2" x 9" for the tuned circuits.

The Franklin is claimed to be stable to within a drift of 25 c/s. up to 7 Mc.

but I found silvered mica to be superior. Originally C1 and C2 were 2.2 pF. but it was found that the oscillator tended to drop out of oscillation on parts of the band so C1 was increased to 3.3 pF. and the oscillation continued all over the band.

A 0.001 μF. silvered mica was used for C6 but as this is rather a large physical size, a 0.001 μF. N.P.O. or even Hi K could be used if so desired.

R1 was a selected 1 megohm 10% ½w. This value was selected on a R/C bridge as being exactly 1 megohm, but 10% tolerance is quite adequate. R6 was a

The value of R6 must be kept as low as possible to limit the effects of the 6CB6, particularly when it is removed from the socket.

The filament voltages on V1 and V2 were reduced to 5.0v. and the cans on these valves were covered with asbestos string. This tended to limit the effects of changes of room temperature.

A shield was placed around V1 components, as shown, to prevent feedback. R4 was fed through the shield to the h.t. and decoupling.

The transformer T1 was an old transformer (i.f.) out of a 522 receiver. Capacity was added to bring it from 12 Mc. to 5 Mc. Then a resistor was placed across the primary to dampen the tuned circuit to obtain a broad-band effect.

The leads from the two coupling condensers should be kept as short as possible. All earth points to the chassis were wired with 12 s.w.g. tinned wire and all points were connected with the same type wire.

A small crystal oscillator for band checking was wired in, although this has not been shown in the diagrams. If you have a crystal calibrator on your receiver, as most modern sets have, the crystal will not be necessary.

The power supply must be well regulated with a VR105 or VR150. Hit the VR tube really hard by applying about 210 volts to it, but don't exceed the 30 mA. limit imposed by the tube ratings.

After the VR tube connect about 50 μF. in electrolytics across it and then some if necessary. (A resistor should be placed in series between the VR tube and the high capacity—otherwise the VR tube will "oscillate" or motorboat. —Ed.) Every bit of 50 cycle ripple must be eliminated or the oscillator will tend to be modulated with the 50 cycles.

All other resistor and capacitor values may be normal quality components.

## COIL AND TUNING CONDENSER ASSEMBLY

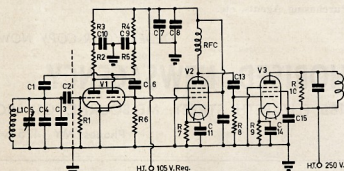
A layer of ¼" asbestos was glued to the inside of the metal box. The coil and condenser was mounted inside, then another layer of ¼" asbestos was glued to the outside of the box for additional heat insulation.

The coil was 8 turns of 14 s.w.g. enamel covered wire on a 1½" ceramic former. The former was taken from the v.f.o. of an AT5. It must be wound very tight and if possible set with goo.

The tuning condenser was a 10-110 pF. ceramic mounted condenser. A 100 pF. and 150 pF. (both 5%, silvered mica) condensers were placed across the tuning condenser. This combination gave 5.0 Mc. to 5.20 Mc.—ample coverage for 7 Mc. and 14 Mc. (on sideband. —Ed.)

Components inside the coil box were wired up using 12 s.w.g. tinned copper wire. The two coupling condensers, C1

(Continued on Page 12)



FRANKLIN OSCILLATOR.

C1, C2—2.2 pF. silver mica, 5% tolerance.  
C3, C6, C15—100 pF. silver mica.  
C4—150 pF. silver mica.  
C5—150 pF. variable.  
C7, C8, C10, C11, C12, C14, C15—0.01 μF. mica.  
C9—5 μF. electrolytic.  
R1—1 meg., ½ watt.  
R2, R5—30K, 1 watt 1% Hi-stability.

R3, R4—1.5K 1 watt.  
R5—15 to 25K ½ watt.  
R7, R9—470 ohms 1 watt.  
R8—100K ½ watt.  
R10—15K 1 watt.  
V1—12AT7.  
V2, V3—6CB6.

The one built was stable to within 0 c/s. drift at 5 Mc. for a period of six hours.

The voltages applied to the oscillator itself do not effect the frequency—in theory. The author found this to be untrue. The tubes used in the oscillator and buffer have no effect on the stability—again a slight distortion of fact.

## NOTES ON THE COMPONENTS

Anyway, to the construction. The oscillator found to be most suitable was a 12AT7 into a 6CB6 with a 6CB5 following. The output from this combination was found to be approximately 0.1v. at 5 Mc. The valve sockets must be ceramic.

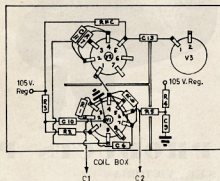
The plate load resistors were 30K 1w. hi stab., decoupled with two 0.01 μF. silver mica condensers and two 1.5K hi stab. resistors. These hi stability resistors were 1% but I don't think the decoupling resistors need be quite so good a quality. I do recommend, however, that the plate load resistors should be very close tolerance.

The decoupling condensers, C1 and C2, must be silvered mica. N.P.E. type condensers are claimed to be adequate

value selected by trial and error on the oscillator itself.

If, when you construct this oscillator, you find that it is not very stable, try varying the size of R6 from approximately 10K to 25K.

R1 and R6 must be earthed at the same point with very short pigtail. Single-point earths must be used on the oscillator.



LAYOUT FOR OSCILLATOR SECTION.

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1961 EDITION

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# NATIONAL FIELD DAY 1961—A VK6 EFFORT

AS early as June 1960, it was decided at a meeting of the West Australian V.h.f. Group (Inc.) that the club station (VK6VFR) would take part in the multi-operator section of the then forthcoming Field Day Contest. To this end a committee was formed whose task it was to rustle up the receivers, transmitters, aerials, etc., etc., required. All bands, 3.5 to 144 Mc., were to be catered for.

A major windfall came along when Kevin VK6ZCB decided to build his shack into a caravan. This he offered for the occasion as a complete v.h.f. station with additional space available to accommodate some 80-100 metre gear.

More equipment problems were very nicely solved when Jim VK6RU offered his Collins station (75A4 and 32S1 at reduced power). Similarly, Jack VK6BU obliged with his Collins 75A1 and Gelo 50GL222 (also at reduced power). Thus main equipment requirements were covered.

Antennae became the next problem. Numerous ambitious schemes were suggested but eventually it was agreed that a simple system of dipoles for the h.f. bands, with yagis for the v.h.f.s., be used. The dipoles were planned to be arranged in the form of a "vee" with of course separate feeders for each.

After some rummaging around, a 2k.v.a. alternator, driven by a single cylinder petrol engine, was located. Whilst we are appreciative, the source of this is best left unmentioned!

Finally, a rendezvous was arranged for 9 a.m. on the site (in the Darling Ranges, 1,000 ft. a.s.l.) on 4th February, for the erection of antennae and setting up of gear.

9 a.m. Saturday duly arrived with several energetic persons on hand and ready for work. Kevin's caravan was moved into position and he and Roy VK6ZDS got to work on erecting the v.h.f. beams atop a 50 ft. telescopic mast. The subject of pinched fingers is not popular with Kevin by the way! Meanwhile, the two 30 ft. telescopic masts for the h.f. dipoles were under way, forming, in addition to a convenient gum tree, the three points of the aforementioned "vee". Here Roy VK6ERY aimed claim to fame with a stone and length of string!

Problems commenced with the unravelling of prefabricated dipoles. It appeared that more attention had been paid to rolling them up than the possibility that they would need unrolling—talk about wire puzzles!

Some little time later a trial run was made on the alternator with satisfactory, but deafening results—an open exhaust system. At first a voltage variation of some 15-30 volts was experienced, but an adjustment to the mixture control corrected this.

As everything seemed to be under control, all agreed it was now time for lunch.

The weather at this stage was very hot and prompted the remark: "At least this is better weather than the storms experienced by a VK3 team of a previous year." No sooner were the words spoken than some very black

clouds loomed up, thunder boomed, lightning flashed, and down came the rain in a freak cloudburst!

First thoughts were for the unprotected power plant. A canvas sheet, brought along "just in case of emergency," was hurriedly flung over the unit. Obviously, though, some more permanent shelter would be required so two cars were commandeered to support the sides of the tarpaulin. This was fine until a miniature lake collected in the middle. This further problem was overcome per medium of VK6RY and VK6HK who acted as centre posts for the next half an hour or so until the weather cleared sufficiently for some bush timber supports to be cut.

Everything was now felt to be ready for anything the elements could turn on.

At 3.30 p.m. W.A.S.T., Jim VK6RU and Jack VK6BU arrived with their equipment which was set up and tested in quick time. The alternator had been running sweetly for some time now.



Interior of VK6ZCB's caravan, looking to the front. This set-up was used in the National Field Day Contest of 1961.

4 p.m. (W.A.S.T.).—Operation got under way with an added snarl from the power supply and much enthusiasm from the operators—but the team had hardly got into stride when at 4.10 p.m. "old faithful" conked out. Diagnosis—ignition trouble.

At least operations did not cease entirely, thanks to the 50 Mc. transistorised walkie-talkie of VK6ZCB and mobile 50 Mc. gear of VK6ZCB. Several contacts were made thereby.

Meanwhile the boys commenced dismantling the engine amidst much helpful advice from onlookers. After the flywheel had been removed it was found that the magneto was in the process of falling apart. This corrected, the plant was deemed ready to start again.

At this point, VK6RU, not one to waste contest time, left the power tent and headed for the controls of his rig. By the time the 250 volts arrived at the transmitter he was ready for the air.

Contacts came but slowly until just before sunset when once again the engine conked. This time flooding was the problem and fuel was found running freely round the open exhaust. This is not recommended practice! Roy VK6RY again dived in and pulled the "carby" down. This time power was

available after only a ten-minute delay. The plant kept running now until closing time, although on several occasions a dash had to be made to make adjustments to prevent a further stoppage. Voltage varied at random during this period between 150-260 volts!

On Sunday, 12th, operation was more routine with contacts on all bands coming slowly but steadily. Even "old faithful" must have kept in mind the saying, "The better the day, the better the deed," as she kept going during the whole of the day's operating period.

Something of a diversion occurred on this Sunday morning. A visiting Amateur remarked, "If you want a contact on another band you had better come and help me put up my 20 metre quad!" So several bodies took him at his word, climbed into a car and off to his home QTH. After much pulling, juggling and twisting, up went the quad, and the promised contacts were later made. This is really working for contacts!

Tension relaxed as time ran out and everyone was still able to smile and joke about the events of the week-end. We certainly found that much enjoyment can be had by a joint effort in the National Field Day Contest and all are looking forward to next time!

As a closing word, the thanks of the V.h.f. Group of W.A. (Inc.) are proffered, not only to those who are mentioned in the text but to the many people who assisted both before and during the event.

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The honour conferred on the Institution sets the seal on its achievements during the past 36 years. The Institution was founded in 1925 when radio engineering, as an industry, was in its infancy.



## D.C. POWER CONVERTER FOR MOBILE

(Continued from Page 3)

transformer temperature rise should be about the same as a receiver type power transformer. A metal box large enough to house all the components should provide adequate cooling area. It is well to remember that the transistor manufacturers permit operation with an internal junction temperature up to 100°C.



Transformer



Dis-assembled T-Core

Suggested winding details are as follows. The transformer should be wound on a fibre former which may be obtained with the two C-cores and it may help if stout cardboard end plates are made and cemented to the fibre. If modern winding wire with tough, straw-coloured enamel is used (such as Lewmex) there is little need for insulation anywhere in the transformer, but layers of paper or tape should be inserted between windings to provide a flat surface on which to build. If old wire is used then a layer of paper, or empire cloth (if you are a Loyalist) should be interleaved between each layer of the secondary. To ensure

oscillation when switching on for the first time, the start and finish of each primary and feedback winding should be carefully marked and wired up as indicated on the circuit diagram.

Primary 1 and 2: Each 23 turns of 18 to 20 s.w.g.

Feedback 3 and 4: Each 29 turns of 26 s.w.g.

Secondary: See text. Use 26 s.w.g.

None of the wire gauges are particularly critical, but if thicker wire is contemplated consult the wire tables to ensure that it will all fit.

When assembling C-cores, keep the halves in the same relative positions as they were when purchased. This will ensure minimum air gap and lowest exciting voltamps. Each core should be clamped together by twisting a loop of stout wire around it, as the special banding strip supplied is hard to use if the proper tool is not available. To reduce vibration, jam the cores in the coil former by using thin wood shavings and to provide protection against climate it is suggested that the entire transformer be boiled in beeswax or dunked in shellac.

At the time of writing three units have been constructed, two by the author, and one by a fellow VK5 Ham.

Here are some test results obtained using accurate model 8 Avo meters:

1. Input: 12.6 v. at 6.87 a.  
Output: 405 v. at 175 mA. = 71 w.  
Efficiency: 82%.
2. Input: 12.6 v. at 4.20 a.  
Output: 410 v. at 110 mA. = 45 w.  
Efficiency: 85%.
3. No load input current = 0.8 amp.
4. Input current with output shorted = 2.4 amp.

## THE ANTENNAMATCH

(Continued from Page 5)

worked against the other until a condition is reached where both the phase angle and impedance indicators have zero readings. In this condition, the r.f. power accepted by the aerial should be the same as that into the artificial load. The p.a. loading should also be equal to that when loaded into the dummy aerial.

Transmitter conditions (that is the values of C1, L and C2) should not be altered after being set up on the dummy aerial and all subsequent adjustments to bring about equal conditions must be made entirely with the matching network.

Experience has shown that with fairly large values of impedance and phase angle condensers widely varying conditions can be catered for. However, if reactance cannot be completely eliminated, i.e. phase angle brought to zero, different values of inductances of the split coil should be tried.

Short acquaintance with The Antennamatch as an aid to correct matching and loading of the transmitter to the aerial will serve to prove its very valuable purpose and will make the user realise just how difficult it is to achieve optimum conditions without it.



## THE FRANKLIN OSCILLATOR

(Continued from Page 9)

and C2. were wired inside the box also. The pigtail wires cut short to prevent vibration.

Incidentally, all components in the oscillator must be mounted very rigidly. No vibration must be permitted. The gang must have a very smooth action.

## CHECKING THE OSCILLATOR

Now a few words on the methods used for checking.

First I beat the v.f.o. with an xtal oscillator just hawkeyed together. There was some drift, about 400 c/s. Next I used a crystal calibrator and for the first hour I found that there was some drift here, too. I was feeling rather disheartened, so I checked it as a last resort on the Bendix BC221.

To my amazement I found that though I had to "correct" the Bendix about every 30 minutes, each time I switched back to "operate" the v.f.o. was zero beat. Several times I checked the v.f.o. to see if it was still operating and sure enough it was.

Then I connected the Bendix output to a c.r.o. and zero beat on the "check" position, watching the pattern on the c.r.o. (a sine wave). When the Bendix was on 5.0 Mc. I zero beat the v.f.o. and once again a sine wave. Whenever I saw a distorted wave form on the c.r.o. I "checked" the Bendix and sure enough the v.f.o. was exactly zero beat.

I allowed the v.f.o. to run into the Bendix for a total of six hours and not once did I have to reset the v.f.o.

This v.f.o. is the ideal v.f.o. for the s.s.b. man. The output is not very high, but for s.s.b. the output is not required to be high.

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# AMATEURS TAKE PART IN PROJECT PHOENIX

The recent party of Victorian firemen which visited country centres in Western Australia contained a number of Amateurs. The visit was sponsored by the Western Rural Fire Brigades Radio Group at the invitation of the Bush Fire Group of W.A.

Purpose was to discuss and demonstrate fire fighting methods with particular emphasis on the use of radio. Phoenix was the name given to the project when it was found that every member of the party had suffered serious or total loss in the Victorian disasters of the early 1940s.

Leader of the party was John 3AGD, who is President of the Group and operator of the Dunkeld Base Station VL3JF. Associate Hugh O'Rourke, affectionately known to firemen as "Chief," flew over to operate the Group's portable base station under his own call VL3KJ. Hugh first obtained this licence to work with several Amateurs in the early days of fire radio and pioneered the present system of networks.

The Group took their own cars and equipment and operated on the Western net frequency of 5265 Kc. Much of the early planning was carried out by the Group Secretary, Tom Kinnerly, VL3KN. Others included Pat 3ADN, the S.W. Zone W.I.C.E.N. Co-ordinator, with XLY Nils using the call VL3KW; Tony 3WB and XLY Pauline, operating his old call 3KI; Kevin 3AKR, who travelled with John 3AGD, using VL3ZK, and Don 3AKN, S.W. Zone Secretary and deputy co-ordinator of S.W. Zone W.I.C.E.N., under the call VL3JA.

Apart from two notable exceptions, the equipment used was home-brew or custom built to network design, much to the surprise of the VL6 boys. The local outfit was found want-

ing and was replaced by a spare outfit complete with antenna.

The gear included a re-built 108 and ATR2C and a neat little home-brew designed by Bert 7BI, then 3BL. This one uses a 6AG5 xtal osc. to a 503 modulated by a 503 Heising fashion, with a two-tube xtal converter to the car radio. The owner-operator, Tom, another Associate member, built and installed the rig which uses the call VL3KN and is the top performer in the network. Ignition interference simply is not by virtue of complete shielding of the whole system. No ignition suppressors are used. Tom is still pondering the problem of the other bloke's interference and those wind driven lightning plants!

Two sets of Amateur gear were taken, that of 3AKN and of 3AKR. The former was pressed into service on the smoke frequency which somewhat curtailed Amateur activity. The latter, mounted in the car of John 3AGD and using his call, was operated mainly by Kevin 3AKR. Our lads showed a total of some 75 stations contacted or visited; too many to list. However, amongst them were Ses 3GP who is also in the smoke business at Nairn in the Adelaide Hills. At Port Augusta, Graham 5GE showed the Group over his f.b. gear. We owe Graham an apology for disturbing his all-too-infrequent rest and our sincere thanks for an insight into the Flying Doctor Network. Our first eyeball QSO in the West was with Tom 6TR and his (square-eyed) monster when the author's demonstration made the news session. Tony 3WB, with his aristocratic mobile, stole the limelight of course.

Kevin, operating as 3AGD/6, distinguished himself by working Tom VK5TC at Wilkes Base on 7 Mc., doing 70 knots or so with the

v.f.o. as front-end injection for the s.s.b. sig. At Albury, Les 6WL played the local 3AKN and 3AGD, and managed to inveigle a tape recording from us for 6WL. Wally 6AG brought Skipper 6WS to meet the convoy in Perth. Skipper 6GGH and XLY Ruth, gear and especially the fibre glass whips. He told us how he overcomes the problems encountered by the fibreless Amateur and left us somewhat humbled and realising that our own are puny enough. Wally arranged a Hamfest later that evening and those whom we met. Skipper 6GGH and XLY Ruth, Jack 6KK, Pat 6PH and Associates Hans and Wolf Proet. John 3AGD lost no time in extending the left hand of Hans, who is the River Ranges D.C. of Scouts. Hans, with Pat 6PH, will be organising the VK6 end during the Jamboree-on-the-Air in October. Travelling home on the train we met another D.C. Kojo, from Ghana, who promised to alert the chaps in 9G1, so xwing the beam that-away during the weekend yet. DX men.

The Group visited the P.M.G. monitoring station, VNA, situated just outside Perth. Here the officer-in-charge, ex-6JJ, showed us room in the room where the local boys sit green with envy and that would leave the well known AFDR model for dead. The antenna farm left us speechless and the subsequent tinkering apparatus again was out of this world.

At Merredin on our re-entry stage, Mal 6MU took the time to deride the local b.s. station he took all into that wonderful shack the town people built.

Time does not permit mentioning all those whom we met or contacted, but our thanks go to all the VK6 and VK5 boys who gave us and the VL3 boys such a wonderful time, to the VK2 boys who kept us posted with news from home, and especially to Dave 5DS and Len 6LG and Mal 6MU who made sure we got home safe and sound. In saying 73 and CUAGN you may be sure the Net really means it.

## HOW CAN THE AMATEUR ASSIST?

Many times we were asked by Amateur "How can we help in this very important show?"

Three problems face the new operator when his brigade decides to form a network. They are, to obtain suitable equipment, to instal and maintain it in the vehicle or base station, and the case of a mobile, to silence the engine noises. In most cases the equipment will be commercially made. However, some may prefer disposals gear which is still available in the surplus and will certainly need some modification well within the average Amateur's capabilities.

Or some may want home-built stuff. Here the Amateur may help by designing and building or helping to build the outfit. There is too the possibility that a group of Amateurs will follow the VK7 boys and build the stuff as a community project. Let it be not forgotten that nearly all the VL3 stuff on Project Phoenix was either home-brew or custom-built to network design.

Installation is normally the maker's responsibility but distance, coupled with today's habit of changing the vehicle frequently, means the job must more than be done in the locality. Radio vehicles can break down at awkward moments, too, which means no radio unless the outfit can transfer to another car. Regular checking of the antenna for resonance and the whole outfit for performance will make all the difference between an efficient network and none at all. Aid to the broken-down set when every minute counts may save many acres and even many lives.

However good the equipment is on the bench, its performance won't be worth tuppence unless the ignition, generator, and other noises from the vehicle are eliminated. This is a recurrent problem and careful study of this problem and suitable action, again in the field, will repay handsomely.

Finally, recognise these VL chaps for what they are, expert firemen and first class operators. Listen to their problems and look for the solution by equipment if no other way. Don't try to teach them operating procedure for their requirements are remote indeed from Amateur procedure and encourage the fact they would understand the mysterious radio for they are the future network technicians and a fertile field for recruits to Amateur Radio.

Every Amateur in Project Phoenix started as a smoke-net operator, nearly every one (in VK3 anyway) is an active member of the W.I.A. and the W.I.C.E.N.

—Don VK3AKN.

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# Trade Review

## NEW B. & K. MODEL 1076 TELEVISION ANALYST

Amalgamated Wireless (Australasia) Ltd. announce an addition to the well known B. & K. range of servicing instruments for which they are sole distributors in Australia. The new instrument is known as Model 1076 "Television Analyst".

The "Analyst" is a t.v. signal generating source used for the rapid location of faults in television receivers. An earlier model (Model 1075) is already widely used in television servicing workshops here. The new model possesses all the features of the earlier type, but has an additional integral unit—a circuit analyser, previously supplied as a separate unit. The result is a single, compact unit, convenient in use and easy to carry.

The "Analyst" is a unique system for rapid fault locating. When familiar with the operation of the instrument a skilled serviceman can locate even the most difficult fault—including intermittents—within a few minutes. Valuable servicing time is thereby greatly reduced, since the greater part of servicing time is usually spent in locating the fault.

"Analyst" has a flying-spot scanner to generate a test pattern which is fed to any stage in the receiver. By narrowing down the points of injection a faulty component can be positively located.

The instrument can be used with no t.v. station on the air, thus reducing the great amount of lost workshop time when stations are not broadcasting.

It can be wired into a workshop system to drive a large number of receivers at one time.

The signal can be applied to any stage in the video, audio, r.f., sync. and sweep sections of the set. No external c.r.o. or waveform analyser is needed—the one instrument does the whole job. The instrument costs £170 plus Sales Tax f.o.b./f.o.r. Australian capital cities.

Further information and photographs (if available) may be obtained from Mr. H. A. Tyrer, Engineering Products Division, Amalgamated Wireless (Australasia) Ltd., postal address: G.P.O. Box 2516, Sydney, or telephone 2-0233, Ext. 348.

## VICEROY S.B. TRANSMITTER

Through the courtesy of R. H. Cunningham Pty. Ltd., "A.R." was able to air-test the K.W. Viceroys Sideband Transmitter.

This unit is supplied with full operating instructions, schematic circuits and an optional power supply, if required. It is only necessary to add a microphone (a D104 was used for our tests) and a Morse key plus an aerial change-over relay.

The whole unit is well laid out with good front appearance, rigid cabinet and chassis, and all metal parts are cadmium plated and passivated. Adequate ventilation is provided by suitable screened holes. Wiring is neat and cabled with all parts so placed that little service difficulties would be experienced in maintaining this unit.

There is no evidence of poor quality nor underrated components. Overall, it is a well made, carefully laid out piece of commercial gear.

The Viceroys is a crystal filter type of s.b. transmitter using a 435 kc. xtal oscillator, driving a balanced low impedance modulator comprising crystal diodes into which is fed the audio signal. A half lattice filter rejects the unwanted sideband and the requisite sideband is then heterodyned to the required frequency by means of a v.f.o. and suitable crystals.

The transmitter is wired from a rear connector to a small control box, and the power supply contains a voltage change switch mounted on the panel, so that it is necessary that the power supply be adjacent to the transmitter. The control box contains two switches which are frequently used, thus they could possibly be better placed on the transmitter panel; if you use only one band, then this switching is no problem, however it proved awkward during the "A.R." tests.

The v.f.o. is well situated in the transmitter and has a very smooth Eddystone dial, free from backlash and including an auxiliary 0-100 logging scale, with the main Amateur bands, 10-30 metres, calibrated on the main dial face.

Several hours were spent in setting up the transmitter and checking the various tuning controls, VOX, etc. No difficulty arose but the VOX is a little tricky until one becomes initiated. A dummy aerial was used for all these tests.

On-the-air checks were then made using s.b., a.m. and c.w.; broadly speaking, s.b. and c.w. reports were excellent, but a.m. was only fair, but little time was spent in trying a.m. because the Viceroys is a s.b. rig. Operation was had on the 40, 40 and 20 metre bands only as there was no activity at a convenient time on the higher frequency bands. About 35 s.b. contacts were made, mostly with overseas stations and reports of voice quality and v.f.o. stability were good. One comment is made that no sideband selection is available and the Viceroys transmits upper s.b. on all bands except 80 mx, so that on 40 mx one is expected to do the impossible.

Unwanted sideband and carrier suppression reports were quite satisfactory; controls did not need frequent adjustment.

For those who may use this s.b. transmitter for c.w. operation, it can be said that the keying is excellent.

No reports on t.v.i. would be of value as the rig was tested in an area of very high t.v. field strength, so needless to say no t.v.i. was experienced.

The unit includes a.l.c. but its effectiveness could only be judged by several local contacts, as no c.r.o. was available at the time.

It is considered that the K.W. Viceroys s.b. transmitter is a well designed and constructed unit, providing quality performance for a very reasonable outlay.

For fuller information, write to the local representatives, R. H. Cunningham Pty. Ltd., 8 Bromham Place, Richmond, E.I., Victoria, or the Interstate agents.

## GLASS ZENERS IN 400 mW. RATINGS

A brand new line of 400 mW. rated Glass Zener Diodes by International Rectifier Corporation has been announced by Warburton Franki. These feature low voltage values (3.3 to 12 volts), extremely low dynamic impedance (to a 5 ohms at  $I_z = 20$  mA.) and low temperature co-efficient ( $-0.062$  to  $-0.060\%$  C.).

Designated types 1N746, 1N759 and 1N759A, the new devices are available in both 5% and 10% voltage tolerance types and meet J.E.D.E.C. registered values of reverse leakage current measured at 1 volt. The new diodes are process selected to provide exceptionally sharp zener characteristics and high stability and excellent voltage regulation is assured over the temperature range from  $-55^{\circ}\text{C.}$  to  $+150^{\circ}\text{C.}$  Extremely small size ( $0.265" \times 0.110"$  diameter) and glass-to-metal hermetic sealing insure a rugged unit capable of long-term reliability.

Full details are available from Warburton Franki's offices in Brisbane, Sydney, Melbourne and Adelaide.

Warburton Franki also recently introduced 28 subminiature glass zener types rated at 250 mW. in the 3.3-30 volt range.

— . . . —

## Book Review

### SILICON RECTIFIER HANDBOOK

By Sarkes-Tarzanian Inc.

A handy volume which will give either old or new Hams an insight into the operation of semi conductor rectifiers.

There chapters on theory, manufacturing methods, rectifier characteristics, typical rectifier circuits, test circuits, rectifier and filter circuit design, and application techniques.

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Our copy from McGills Newsagency, 183-3 Elizabeth Street, Melbourne.

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By John A. Comstock

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Price 16/- plus 1/- postage. Our copy from McGills Newsagency, 183-3 Elizabeth Street, Melbourne.

— . . . —

### SCHOLARS TAKE PART IN QSOs

Benalla High School (Vic.) students took part in a radio broadcast as part of Education Week in New South Wales in August.

Throughout N.S.W. schools spoke to each other over radio stations and Benalla was active from Victoria. This was arranged following discussion between Ken SKR of Benalla and a teacher at Louie's Jetty, near Newcastle.

Members of the Benalla High School Radio Club were active in the activity, and Rotary Exchange student, Mary Ellen Rosa, from America, spoke to the other schools over the air. Club members, Frank Dyson and Peter Amor, assisted with the radio side of the contact. —"Benalla Standard," 14/8/61.



# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

## GENTLEMEN'S AGREEMENT

Editor "A.R." Dear Sir,

Continuation of the so-called "Gentlemen's Agreement" in allowing c.w. the lower 50 kc. of the 7 and 3.5 Mc. band, as advocated under the Federal Executive notes in August issue of "A.R." does not really represent the views of members, but a minute section who demand exclusive territory for their out-moded form of communication—C.W.

That the Federal Executive should back this minority against the majority is quite beyond human understanding. Research undertaken for the undersigned by a top Australian market research executive (and reported in these columns some few months back) proved beyond all doubt that there was hardly any c.w. activity which was in marked contrast to phone, especially t.s.b.

Whilst appreciating there will be more activity on the lower frequency bands as the sun-spot minima approaches, this means that more and more e.s.b. and a.m. phone will be moving to these bands and naturally will want and demand more room. My advice to them is ignore these so-called "gentlemen's agreements" and operate where and when it suits them.

Instead of dictating policy through notes in "A.R." the Federal Executive if it has any democratic spirit left in it) would be far better seeking the opinion of the members than trying to perpetuate an agreement which, to most never existed. May I suggest to all that instead of sitting back and following a suggestion by F.E., that members through their own Division urge a postal plebiscite as to whether we should be a party to these "gentlemen's agreements". To cut down expense for another inevitable plebiscite of the future perhaps a second question might be included: "Are you in favour of the abolition of c.w.?" The answers to the latter, like the former, would be quite startling.

—Roth Jones, VK3BG.

## SHORT WAVE LISTENING

Editor "A.R." Dear Sir,

When I first started s.w.l'ing a little over 12 months ago there were quite a few things that I wished to know as the right method could be adopted. Information at that time was not to be obtained locally so I decided to pen my queries to the scribe of the s.w.l. page in "A.R." who replied telling me of the right procedure necessary for the hobby. Since then I have written once a month, many times we don't agree on certain things. My cards, for instance, he said they were lousy. Well, that's OK by me. I thought they were good as it would not do for us to all have the same type of cards. Such comments create new ideas and another person can see your errors better than you can yourself.

Maurie is straight to the point, has helped me no end, and no doubt that applies not only to myself but many s.w.l's. who write to him from time to time. I look forward to that page in "A.R." each month with interest, and think that he has done an excellent job in keeping it intact. So keep up the good work OM, as I feel sure that all s.w.l's. in VK land appreciate what you are doing for them.

—Chas. Abernethy, WTA-1221.

## R.D. CONTEST OPERATING

Editor "A.R." Dear Sir,

I have just submitted my log for the 1961 R.D. Contest. As usual I did enjoy the Contest, however I do feel that it was marred by several really atrocious signals from all parts of VK.

It is inevitable in a contest of this nature that some signals will be poor. There are several reasons for this state of affairs:

- (a) Something has "packed up" in the gear or got out of adjustment during the contest unbeknown to the operator.
  - (b) Chaps come on for about the only time they put in on the air from year to year without bothering to check out the rig beforehand for any bugs and correct operation.
  - (c) Some try to get more out of the gear for contest purposes than they would normally, resulting in incorrect loading, improper matching, etc.
  - (d) Some just plain overmodulate to attract attention and personality.
- My comments on these four categories are:
- (a) Tell the chap when you work him that there's something wrong with his signal. If

he's any sort of a bloke he'll take it the right way, and act on it.

(b) It's nice to see these chaps come on the air. I really think they are in the minority as operators, and we probably just have to tolerate them.

(c) These fellows we can help by teaching them that a clean, undistorted signal, even though lower powered, is more effective than a poor higher powered signal. Those who can could well assist in providing technical information and practical help to aid in getting the offending equipment operating correctly. I might add that I have received much of this type of assistance from other operators around Elizabeth, namely VK5DY and VK5NO.

(d) These are the kind we don't want on the band until they learn better. They are selfish and as such very hard to counter or reason with. Perhaps they could be penalised by disqualification upon report of monitoring stations appointed by the Advisory Committee in each State.

Lastly, but not least, I must comment upon the subject of operating courtesy. By and large, in a contest of this nature, it is impossible not to QRM other stations from time to time, but this business of sitting on a frequency, waiting until the station occupied by another station obviously being heard by the offender trying to swap numbers, and after having spoiled his attempt, going ahead and exchanging numbers with that station you just lost for him, really gets my goat. Fortunately there only appear to be several of these types in the contest, but we can do without them.

Here in Elizabeth we have one of the highest densities of stations for a given area but we all seem to get on quite well with each other. Look at last year's scores. At least six Elizabeth stations were amongst the State's highest scorers.

But, can't other fellows do likewise as far as transmissions and courtesy are concerned? They will find they get just as much, if not more, fun out of their hobby.

In Elizabeth we just can't appear to have stations with poor transmissions. Isn't the boat on the same foot elsewhere?

Thanks to all good operators who exchanged numbers with me. To the bad ones with incoherent transmissions, the errors of the Wouff Hong.

—Ian J. Hunt, VK5QX.

## LIMITED LICENSEES

Editor "A.R." Dear Sir,

As a comparative newcomer I do more listening than talking (I hope), and a few of the old hands seem to think that one of the reasons the lower frequency bands still have room is because the Z calls are lazy. Yes "lazy" is the word used by them.

Most of our Z calls are young chaps who have the ability to obtain their full license. But why don't they obtain it? Once they get on the air so many seem content to slay a Z. What a boost they could give to the lower frequencies.

Perhaps the young chaps haven't the cash? Is there more fun? I do know the reason for staying with a limited license. It has been suggested to me that the limited license be made current for one year only to ensure that the full license is taken up.

What do others think?  
—Peter W. Brown, VK4PF.

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# SIDE BAND

**Bud Pounsett, VK2AQJ**  
6 Alice Street,  
Queanbeyan, N.S.W.

## SINGLE SIDE BAND 46 YEARS AGO

We hear a lot of comment on the bands and in various journals about this "new" technique "Single Sideband". In Australia, s.s.b. might be called new to the Amateur bands, if something that goes back over a decade can be termed "new".

A little research into the history of s.s.b. brought to light some very interesting facts. The man to whom the credit of discovering the possibilities of single sideband must go, is John R. Carson, of the U.S.A., who submitted a paper as early as 1915 advancing the idea of transmitting only one sideband. The composition of an amplitude modulated signal had been established mathematically about a year earlier in 1914. That is, that it consisted of a carrier plus two identical sidebands.

However, as is often the case, the theory was established, but the practical side of the art was not sufficiently advanced to bring a single sideband system into being. At this time (1915) the United States Navy was conducting research into s.s.b. transmission and it is interesting to note that a form of s.s.b. was obtained by detuning the antenna system. The very low frequency used made it possible to detune the antenna sufficiently to pass one sideband well and attenuate the other. This was carried out at the famous U.S.N. radio station, NAA, at Arlington, Virginia.

Experimental work was carried out in 1923 in trans-Atlantic communication using s.s.b. with a pilot carrier on a frequency of 57 kc. These experiments culminated in the trans-Atlantic public radio-telephone using s.s.b. in 1927. By 1930 s.s.b. had come to be generally used on all overseas radio-telephone circuits and was made of the high frequency spectrum. Independent sideband and multiplexing was further developed until today we have high standard of communications has been reached.

### But what of Amateur participation?

As early as 1933 Robert Moore, WDEI, built and operated an s.s.b. transmitter in the Amateur bands and in 1934, half a dozen Amateurs in the U.S.A. were using single sideband. However, progress was slow and it was not until after World War II, that the pace began to quicken. Today we are well aware of the fact that sideband has arrived to stay. In fact it took twenty years ago but only a few noticed it and took advantage of all that it has to offer.

### VK2ON TRANSMITTER (Part 5)

The first linear stage (there are three of them) uses a 6AG7 in Class AB<sub>1</sub>. Plenty of output is obtained to drive an EL38 g.p. which excites 514K to g.p. As there is gain to spare, a volume control is used in the form of variable bias to the 6AG7. This varies from 3-13 volts. A voltmeter applied to the test point (cathode) tells when cut-off is being approached. Too high a bias would bring distortion. Reducing the gain here lowers spurious responses and carrier level. The gain can be advanced to compensate for losses on the higher frequency bands.

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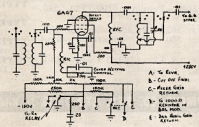
The extra netting control is used when the netting signal is not sufficient. It could be combined with the netting switch of course. A shield across the bottom of the 6AG7 socket is necessary. The 0.01  $\mu$ F. by-passing disc capacitors are connected by very short leads to the socket pins. The tuned circuits have about 120 pF. total capacity for 80 metres, 75 pF. for 40, 35 pF. for 20, and 20 pF. for 15 and 10 metres. The cathode tap of the following grounded grid EL38 valve is carefully adjusted on each coil.

A small variation here can alter the power output greatly. The tap is placed between 10 and 20 per cent. of total turns and from earth end. The 0.01  $\mu$ F. output condenser is only to isolate a germanium diode metering circuit in the next chassis. Such an r.f. indicator could be placed in the exciter chassis, of course. The band switches are all ganged although shown separate on the diagram.

Class AB<sub>1</sub> operation is used to obtain more output, up to 5-10 watts if required. Only 1 watt is needed, however, to drive the EL38.

The screen voltage exceeds 150 volts, the rated maximum, but the 6AG7 does not appear to mind this. The 10B exciter has a similar circuit and 300 volts is used so it is amazing what this tube will stand! In grounded grid operation, a plate voltage of 500 does no harm.

The following two linear stages are housed in a separate box, a BC375 chassis, and it is hoped to describe these in next month's issue.



VK2ON's First Linear Amplifier.

### BREAK-IN

Recently there has been mention made in various overseas journals of this "Break-Break" that is common in sideband circles. Listening around the band I have heard no further caustic comments on this often rude procedure. How often have you been having a pleasant and interesting contact and had it broken up by a third station? How often have you yourself been guilty? I think we all have at some time.

I do not advocate banning breaking-in, but I think a few simple rules could be applied. Firstly, ask yourself if you have anything to contribute to the conversation. This means listening for several minutes. This will give you a picture of who is in the net if there are more than two stations involved. It will also tell you what order the net is in, and this is important so that you know whose turn it is, when you pass it on.

When joining a net do not monopolise the conversation with one station and leave the other chaps or chaps out in the cold. This adds up to rather bad manners. Do not try to join a net in the middle of a point or explanation that one of the participants is making. This is rude, interrupting and most annoying to all concerned. The time to join, is when station identifications are being given and then the announcement of your own call sign will be sufficient indication that you are ON frequency. This leads to another point, please be ON frequency. One of the joys of sideband operation is VOX, so let us use it intelligently and properly.

### THE LATEST FROM DRAKE

No doubt you have heard of the Drake 1A and 2A receivers. Some fortunate Amateurs in Australia have one in their shacks but for most of us these receivers are usually at the other end of the contact across the Pacific Ocean.

The R. L. Drake Company of Miamisburg, Ohio, have produced another model, this time the 2B receiver. The 2B has five Amateur bands, 90 to 15 metres as standard equipment, plus two additional ranges in the 10 metre band and five other bands of your choice, anywhere from 3.5 to 30 Mc., as accessories. Each band is 600 kc. wide.

This receiver is of triple conversion design having the first I.F. variable from 3.5 to 4.1 Mc. and a second i.f. at 50 Kc. The first oscillator is crystal controlled, which gives excellent stability. In fact stability is of a very high order in all of Drake's designs.

The front end of this receiver is very interesting. The tubes used are a 6BZ6 r.f. amplifier and a 6B8 as mixer and crystal oscillator. The antenna and mixer coils are tuned by a variable capacitor coming out to the front panel and independent of the main tuning dial. This control requires peaking from band to band, but is much superior to broad-band tuning. Homebrew receiver builders could take a leaf out of Drake's book in this respect. The calibration of the tuning dial allows frequencies to be read to approximately 1 Kc.

The 50 Kc. I.F. amplifier has three different switchable bandwidths—0.5 Kc., 2.1 Kc. and 3.5 Kc. with band pass tuning. A product or diode detector is available. The Drake 2B is attractive physically, being very compact with measurements of 12 in. wide, 7 in. high and 9 in. deep.

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**TYPE PT1400.**—Primary: 200, 220, 230, 240 volts.

Secondary: 565, 500, 425 volts per side of c.t., 250 mA. condenser input filter.

Filaments: 2 x 6.3v. (3a.), 2 x 2.5v. (3a.), 5v. (3a.). Horizontal mounting.

**TYPE PT1371.**—Primary: 200, 220, 230, 240 volts.

Secondary: 1000, 850, 750, 600, 500 volts per side of c.t. 300-400 mA. choke input filter.

**TYPE PT1305.**—Primary: 200, 220, 230, 240 volts.

Secondary: 2.5v. c.t. 10a. for 2 x 866/A fls. Max.: D.C. wkg. 3000 volts.

**TYPE PT1516.**—5 v. at 3 a., 1000 v. D.C. working. For use with h.t. power supply and high-level negative peak clipper filament voltage.

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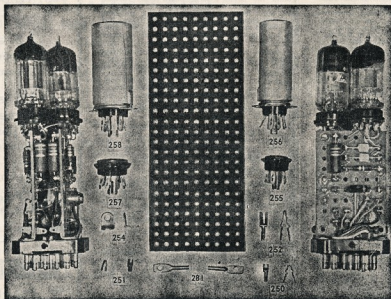
**TYPE Z3046.**—10 Henrys 300 mA. D.C. resistance = 90 ohms.

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#

# S.W.L.

**Maurie Cox, WIA-13055**  
Flat 1, 37 Boyd Crescent,  
Olympic Village, Heidelberg,  
N.23, Victoria.

Hi there Cox, how are you all? How's DX this month? Now what can I write about in this first part of the notes? Ah, yes, as from the end of this year you will have to write to write this page for you all. The two culprits are Robert Young (not the film star) and Ian Woodman.

They will be doing this page for the next twelve months while I go back to school. So hope you will keep writing to them like you have to me and I am sure they will make a success of the s.w.l. page.

The awards have now been re-written by Eric Treblecock (thank you Eric) and the VK Contest has also been re-written (by me) and submitted to s.w.l.

In the VK Contest there will be no overall winner as there are seven sections all told. I am pretty sure this contest could be run annually. More about it later.

## VK NEWSREEL

The new office-bearers for the VK3 Group, elected on 25/8/61, are as follows: Mac, Hillard, President; David Fraser and Noel Harrison, Vice-Presidents; Robert Young, Secretary; Ian Woodman, Asst. Secretary and S.w.l. Rep. to Council. The organising committee are the office-bearers.

Construction nights are going to start at long last. Ray Price, 13054, has offered his services to the boys and not forgetting Ian Woodman. First night will be 13th October so all you lads who are keen to construct your own receivers, come along (once again on Friday) at 8.15 p.m. in the old Victory Publicity Buildings, 262 Queen Street). These nights will be held on the second Friday of each month. So come one, come all!

## R.D. WEEK-END

Five of us went to Ray Price's home at Ferntree Gully and quite some large scores were obtained. I think Rob Young headed up all with 500 or 600 pts.—he stayed up all night. Ray was master of ceremonies, flitting here and there and keeping a watchful eye on us. We were in a sun room on top of a hill over-looking the main road. I think we enjoyed the scenery too much, otherwise bigger scores may have been obtained. Louise, Ray's XYL, looked after us (food) just as if we were at home; she dished up some really beautiful meals. Our very special thanks to you Louise and Ray, for allowing us the use of your QTH. We certainly had a wonderful week-end.

I wonder why I haven't any news from VK2 or VK6? Perhaps I could have some for the page in the Nov. issue. How about it?

## TASMANIA

Nev. Fisher is the new correspondent officer for the Group and here is the news from the Apple Isle.

Their last meeting was held on 9/8/61 and was quite a success, even though there were only nine present. Miscellaneous bits of gear and junk were taken along and stock-piled ready for their next meeting when they will have a construction night as well as supply the young and (therefore poorer) members with something to listen to s.w. Some QSL cards were given to members who did not possess any. They will be represented at the Fox Hunt by the Tourist Bureau. Twenty minutes of Morse practice and chin-wagging filled in the rest of the evening.

There will be a s.w.l. exhibit with the main W.I.A. exhibit at the forthcoming "Hobbies and Careers Exhibition" being held in the city hall by the J.C.s. It is also expected that they will be represented at the Fox Hunt being held by the Building Fund Committee.

Now a little news from the active members. Richard Rogers, YZAN, is active on 1 mx and up until New Year's he bought his Command (4-9) Rx. was getting in a lot of c.w. practice. He also s.w.s. on v.h.f. with a t.v. set. He is going to build a 100 watt shorty. Mike Jenner, 17897/VK7AZA, is s.w.l. on 6 mx (hrd. four VK5s) and is having doubler trouble in his

new h.b. 6 mx tx. Ted Beard is having ant. feeder troubles and his Eddystone 640 has some burnt-out coils. (What the hec have you been doing to burn out the coils, Edward?)

David Berry has wrecked his converter/Command rig and is experimenting on 1 and 2 mx; he has made one contact—crossband duplex. John Dawes at present is using a d.w. b.c. set and is planning a converter. Grahame Johnson (a new member) (get him in the W.I.A. you guys) has recently purchased a 3-6 Command (the one Nev. wanted) and after a bit of heater voltage trouble is now taking in the DX. Neville has bought a 6-9 Mc. Command (everyone has a Command, they must be good) which will be his rx for during the week when he'll be in Hobart. It will be used mainly for c.w. practice. By now he will have his ground plane up and is using 50 yds. of 50 ohm coax to feed it.

Thanks Nev. for all the doings of the VK7 gang. Very interesting, keep up the good work, see you next month.

## CORRESPONDENCE

My thanks to the following listeners who have written to me on their doings: 13021, Peter Dew; 15039, Peter Field; BE8R195/13042, Eric Treblecock; 12211, Chas. Abernathy; VK4 s.w.l., Charles Thorpe; 13097, Ian McNab; VK4 s.w.l., Bill John; 13022, Don Grantley; VK4/L1313, After Westcott; 13013, Ian Thomas; a new VK3 member, 13106, Howard Burger; 13044, J. Kennedy; and the last is Peter Vernon, of Harbord, VK2 land.

By crikky UAIAO on s.w. in Kaligrad is calling his head off. VK3, ZL 5 x and nobody answers him. I am listening to him as I write these notes.



Peter Dew obtained a nice total in the R.D. Contest—631, very good. Peter listens to s.w. b.c.; he's a monitor for the Voice of Germany, Swiss S.W.S., Radio Japan and the Voice of Free Korea. On medium wave he tells me that a 1200 GMT on 1190 Kc. every night, Radio Peking booms in, and on 1140 Kc. from 1130 to 1630 GMT one can hear military V.O.A. in the Philippines in various languages.

Peter Field has had some new countries confirmed and has also heard quite a lot of DX. Thanks for the letter Peter, see you later.

From Eric Treblecock, the following: He spent a good listening and QSLing session in the R.D. Contest; he scored 500 plus points and logged 200 stations. His scores now are 279 heard and QSLs from 271. FQHW, Teched Republic gave him QSL 271 and KH8EDY/Kure Is. gave him heard 279. The KH6 is on 14 c.w. most evenings (yes, and he's also on 14 s.w.). Kure Is. one of the more recent countries named a newly by A.R.R.L. In August he received about 40 QSLs up to 15th. Eric's log entries now total 246,053, so he's creeping nearer to the quarter million mark. Stop Press. Eric is now 272 confirmed, ACSPN of Bhutan is his latest.

Charles Abernathy. His scores for the DX ladder are going up steadily. Chas. spent 24 hrs. on the R.D. Contest for 800 points; should have scored more, but due to one of his rx's breaking down didn't make the grade. Mary Charlie's XYL sat up with him until 4.30 a.m. and kept supplying him with coffee and moral support, both of which he says were very acceptable. He's going to make a 16 and 15 mx converter for the Eddystone.

New associate member from VK4, Bill Jehn, sent me down some loggings of DX he's heard. Bill, how about a description of your gear and antennae in use?

Charles Thorpe has at last received his Oceania Contest Certificate after waiting 12 months. He now possesses 16 certificates; apparently he wins all the contests, last being the N.P.D. in VK4.

Ian McNabb heard quite a bit of DX on 20 mx around 11 p.m., but doesn't say what he's heard.

Don Grantley has been conspicuous by his absence; has received quite a few interesting QSL cards of late and is at the moment on three weeks' annual leave and is doing quite a bit of listening. Don scored 522 pts. in the R.D. Contest for six hours' listening.

Ian Thomas, university student, nice lad too is on four weeks' vacation; lucky guy, but he's got to study for exams. All the very best Ian. If he passes his exams, he will graduate with a B.Sc.

Howard Burger, of Hamilton, Vic., a new associate member, wrote me just before the R.D. Contest wanting to know the details of it. Howard, I am sorry if you didn't get it before that week-end. Hope you logged a big score. Howard used to have a No. 19 set, but now hears all the DX on a recently acquired AB7 and by his description it's pretty good; it has a product detector and works very well on s.w. The ant. is a Zepp and in his opinion is better than a doubler.

John Kennedy, of Healesville, Vic., another new s.w.l., wrote me queries on the QSL Bureau and in three months heard 20 new countries with four confirmed. What gear and ant. are you using John? He hopes to do his A.O.C.P. some day.

Brian L5044 (can't think of his surname) wrote me a short note. His rx is a five-tube

hotted up (by 5N0) superhet. and goes like a bomb. His ant. is a windom up 10 ft. and it pulls in the DX.

QSL cards received this month: 13035—WBFUV, WAFMAC; 13042/BE8R195—RQJAT, W2ATN/EP, HK1QG, KM8BT, K2AMQ, LU1HL, OA4FM, UA2AG, VU2HS, ZC4PF, FQHW, 60MIT, EP1AD, MP4BC and TV1AD (what a XYL, 13065—ZL4AG, W2WZ, VK4ZC, VK6ZCB/P (6 mx); 13023—VSSAAG, V4R4CB, KG1CQ and CRSAK; 16021—FK8AU, ZS1KX, VK4A, W2WZ, 16 Mc. phone, WNPZP and KG4AT; 12011—VKBAB and KE1FB; 2011—FK8AE and VE6EM; 15039—457YL, KH8BPF, TG8BK, 9M2DQ, and G1ARY.

## DX LADDER

	Countries	Zns.	S.A.s.	S.A.b.	Countries	Zns.	S.A.s.	S.A.b.
Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.
E. Treblecock	272	279	40	650	E. Treblecock	272	279	40
D. Grantley	81	272	36	57	D. Grantley	81	272	36
A. Westcott	77	159	31	92	A. Westcott	77	159	31
M. Hilliard	62	200	26	72	M. Hilliard	62	200	26
M. Cox	201	19	3	83	M. Cox	201	19	3
C. Abernathy	27	36	21	77	C. Abernathy	27	36	21
P. Dew	17	163	15	57	P. Dew	17	163	15
I. Thomas	16	130	13	36	I. Thomas	16	130	13
P. Field	16	130	13	36	P. Field	16	130	13
N. Harrison	12	119	9	31	N. Harrison	12	119	9
D. Jenner	11	106	7	27	D. Jenner	11	106	7
N. Fisher	3	36	3	3	N. Fisher	3	36	3
R. Wood	3	3	3	3	R. Wood	3	3	3
R. Thompson	2	73	2	2	R. Thompson	2	73	2
T. Mills	2	14	2	2	T. Mills	2	14	2
J. Walker	1	8	1	1	J. Walker	1	8	1

So long s.w.l.s. till next month. Very best of DX, 73 Maurie 13055.





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## PREDICTION CHART, OCT. '61

Me.	E. AUSTRALIA — W. EUROPE S.R.																Me.
0	2	4	6	8	10	12	14	16	18	20	22	24					0
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28																	28
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E. AUSTRALIA — W. EUROPE L.R.																	
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W. AUSTRALIA — W. EUROPE																	
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# NOTES

## FEDERAL QSL BUREAU

Bill Hanson, ex-VK0BH, has had his cards printed and these will be distributed to approx. 600 stations during September and October. Bill is now on the road for his two-year "spell" with the VK Armed Forces.

Ray LASHE/M, operator on the T/T Beaumont, and who met many VK3 Hams at the Collins Exhibition at South Melbourne, was again at Geelong (Sept. 7/8). The ship stayed only 24 hours this trip so Ray was unable to get to Melbourne. He sends his good wishes and thanks to all VK Hams for their kindness to him. It will be his last trip on this vessel. The T.O.P.S. is staging an 80 metre activity contest from 1200z Dec. 16 to 1200z Dec. 17. This is the last attempt at holding this contest unless more activity is evident. It is open to all.

Heard on 14600 kc. BYIPK giving QTH as Peking and name Liang. Gave QSL address as Box 427, Peking, and only QSOed UA stations.

—Ray Jones, VK3RJ, Manager.

## NEW SOUTH WALES

The August general meeting of the Division saw a disappointing attendance, more especially since a most interesting lecture was scheduled for the evening. The speaker, Mr. J. B. Robertson, University of N.S.W., gave an absorbing discourse on the many types of antennae which have been designed over the years, their characteristics and in many cases their shortcomings. Many questions were asked of the lecturer, indicating the interest taken in his subject. The President, Bill ZYB, dropped in as visitor. Noel ZAHU, to propose the vote of thanks.

Owing to the lack of a quorum, no business was conducted, but a discussion was held on several subjects of Divisional interest.

The mid-monthly meeting, which the Division has been conducting for some time, for the benefit and instruction of members, are to come to an end. The last of these will have been held in September. It will be recalled that the task of arranging such functions as this is an onerous one, and we feel that Harold ZAAH has provided during the past.

### TAPED LECTURES

All clubs and groups are requested to avail themselves of this free service, only return postage for the tape is required, and use this fine collection of tapes which Harold has organised for your benefit.

We would bring to mind the following tapes: Remote Control and Supervisory Equipment, Aircraft Navigational Aids, V.H.F. Omni-Range, made by Peter Griffin, of D.C.A.

If you are doubtful of the nature of these tapes, they are all tapes made as a result of monthly meeting lectures. A line drawn in the Education Officer will describe their contents.

### HUNTER BRANCH

Well, how did you enjoy the Convention? Now, after seeing all those nice mobile rigs, haven't you decided to build one for yourself? I think I've been threatening for many moons to get some mobile gear going and now I'm finally convinced that it must be so for next year. Yes, I'd like me to talk about it, wouldn't you say, "What about the AT's?" Anyway, I'm sure that all those who did manage to get along enjoyed themselves. I did, too, those who were not there, think what you missed!

The last meeting, by the way, was again very well attended, no doubt because of the draw-card. Yes, I did talk about the new L2AC was there to describe an improved method of generating s.s.b. It seems to me that Leo recently has been doing a lot of work about maths, and physics than is really the case because some of the zero swapping that filled the board really had us all guessing. Despite this, I think he did a very good job, but correctly. Those who pretend to be exponents of the gentle art of s.s.b. no doubt benefited greatly from what was said and lectured, such as this one do a great deal of good for the

hobby. Congrats. on a job well done, Leo. The night weather on this occasion was hardly any sort of reward, except for the goodies.

Twenty-three members and ten associates were present, among them quite a few faces we have not seen for some time. Goodies came in this department to ZVU, 2ANU, 2AHA, 2AGD, 2ZSC and Kev Woods, our new associate. At the conclusion of the meeting, a certain gent with a broad north country accent found himself unable to distinguish through his rain bespattered spectacles the registration number on a certain car parked at the rear of the building. I might mention it was not only one there, but Shannon, to whom I refer, decided to stand in the rain and below, as only he knows how. This monstrous note was sufficiently strong to reach the sheltering crew two hundred yards away. Yes, we charged him. At long last, those who were in the charge of the call sign register have rewarded impatient members Gordon, Ian and David with said call signs. Gordon becomes 2ZSG (you'll notice he's in reverse), Ian is 2AIF (I suppose he should be thankful to get one initial letter and an anglicised version of the other), and David — you'll never guess, I wrote your call sign on a piece of paper and promptly lost it! Still this is better than getting it wrong, I suppose. David tells me he has been on with borrowed gear and is looking forward to news, and Ian has got away to a good start.

I don't think any of these chaps had a shot at the R.D. Contest, but from what I could hear, most of the local boys had a go and Harold 2AHA, as haven't managed to get a good score. I haven't forgotten Chris 2PZ, Geoff 2VU or Ian 2CJ. I would have to doubt quite a few others who I did not hear.

The mystery of the mighty signal reports given by Jim 2ABT is solved. Apparently this man has a two-stage pre-selection in front of the H.R.O. and according to authentic reports it kicks the signal along no end.

Ron 2ASJ has a fine QTH at Stockton with a good new set of equipment. The scene of a gathering of some of the boys a few weeks back. Object, to get Ron's 20 m beam back into working order. To assist, object achieved. Harold 2AHA dreamed up a test scheme and those there to result were Varley 25F, Harry 2AFA, Norm 2ANA, Stuart 2AYF, Tony, Sid, and Ron. The result would be true to say we all had a good time and our thanks to Mrs. Stuart who dispensed the much needed refreshments. Never have I seen so much activity in one day. The suggestion was made that the construction crew do the rounds and then we'd all have beams. By the way, I think you should have a foot key? Then go to Ron's some day and have yourself a lesson. It's not so easy as you may think.

By this time you all should know how to improve the performance of your rx and if you want to learn more about what people build and whether or not it works, then come along to the next meeting as well. This will take the form of a "do-it-yourself" night and you are assured of a good time and the chance for a look at some more interesting gear. Don't be superstitious, even though it is Friday 13th. The usual meeting place, Newcastle University College, under the main building, go.

I'm not making the admission that I arise early enough to hear them, but I am informed

## OBITUARY

TED JENKINS, VK3KQ

It is with deep regret that the Federal Executive Records the passing of Ted Jenkins, VK3KQ, on 9th August, 1961, after a short illness.

Ted, who was particularly well known in DX circles throughout the world, was active as an Amateur for over 20 years from his home in Elwood and also from his holiday home at Churchill Island in Western Port Bay.

As a result of an accident in his teens, Amateur Radio was his only hobby. In contact with others he was otherwise denied by this misfortune. His cheerful disposition and readiness and time for technique endeared him to all who knew and visited him.

In the late forties, he served for several years as Federal Contest Manager, and was one of those responsible for formulating the rules of the Remembrance Day Contest and the Christmas Day Contest.

He will be sadly missed by his many friends outside of Amateur Radio as well as those he contacted over the air.

Our deepest sympathy is extended to his family and relations and to his life-long companion, Sister Campbell.

that the Goons may now also be heard on 80 in the mornings. So that's what Mr. Rose was doing. The little Bob 2AQR is a movie man as well you know and I have it from a reliable source that he is having a camerascop attachment put on the camera. The little Bob is a real well portrayed.

Well, to far now and don't forget the 13th. You'll bring your rabbit's foot, won't you, Dr. 2AKX.

## BLUE MOUNTAINS SECTION

The August monthly meeting was held at Lawson. Fourteen members and visitors (2ZTM and 3AFL) were made welcome.

The date for the Blue Mountains Field Day has been fixed for 5th November at Lawson Swimming Pool. The programme consists of hidden tx hunts, lucky dips and other competitions for all. Look in the Bulletin for details.

Divisional councillor, Tim 2ZTM, dropped in on his way through to Newnes Junction. Tim outlined the latest developments regarding the new Divisional building at Alchesson Street.

It is expected to be finished some time in the new year. It appears that there is a great demand for equipment and visitors, so chaps buy up disposals for tomorrow and make way for today's building. Sid 2AVK has been picked for the night right this time, nice meeting you Stan after being so much of you on Sid's rig.

My rplies tell me that Jack Ferris is putting up a new antenna. Also Noel Walker is building a new rx and Ray Watts from Mt. Druitt is looking for a 2 m rx. So, with a little encouragement perhaps we shall hear some more QRM. Col 2AQU is on 144 and by the time these notes hit the stands, Col should be receiving on 2 m. Tx is 522 modified, the xtal coming out at 147.000 m. xtal locked, converter and an eleven element yagi.

Ken 2AVN, Norm 2QA and yours truly are all looking out for equipment for the bush fire and C.D.E. communications. Dave 2NK and Wal 2MZ are already in business and Wal being the ring leader, quite a few nights have been spent on the spot for operational advice. Some 6000s and CG10 xtal diodes were made available to the club and should prove of great use to the club.

Best of luck to Bob 2ASZ, who I heard putting up a big score in the R.D. Contest. It appears that everybody in the club put in the record score 2AQR is on 80 m. for the holidays next month and is now putting his week-end in on his car and leaving Radio Australia for the holidays. Dave 2NK is giving a Civil Defence Lecture on Communications shortly and at present a car load of members will be present at Lawson to cheer him on. 78, 2AAR.

## CENTRAL COAST ZONE

Preparations are under way to make the November 1st Day in Gosford Waterfront another enjoyable outing for Hams from far and wide. Perhaps some of the new 2 m guys will be taking part in the tx hunts with John 2ZJT, Chuck 2NI, Major 2RU, Doug 2ASA and Bob 2IN are the active 144 men at present, with the occasional appearance of your scribbles. Dave 2NK has been working on his "two-pint pots" in the co-ax line and so far this points to cut out t.v. The dimensions for the final cut are 100 x 100 x 100. I'm recent "QST". These models are constructed from g.b. downpipe.

Alec 2AAG is investigating the virtues of a 2 m operation. He has a new house at Kulnara (2AAK) completed by December. His home in the mountains is just the place for quiet relaxation, good orange trees and fruitables. Ken 2AFH and Frank 2AFJ will shortly be on two m. Reg 2AI has made more trips than any of them. He has been to the States and visits to Broken Hill, Wangaratta, Albion and Wages. Gosford members were pleased to hear Ernie 2EH and Phil 3NN recently from their travels. We should see him back in Gosford soon after a trip to JA land.

Remember Wednesday, 11th October—Gosford Bush School Exhibition. From 9.00 a.m. to 5.00 p.m. 2AFY, the Gosford Radio Club station, will be operating on 40 and 80 m. Experience with a 2 m rig will be brought forth some interesting results, chiefly by venting flat-topping and taking up the normal bandwidth for the s.s.b. signal.

## S.W.L. GROUP

We missed the press last month owing to a slight error, but here we are again. There have been a number of letters about the ART manuals, but due to stencil problems there is a slight delay in the production of the second volume. All orders will be satisfied as soon as possible.

## "IAN MACMILLAN" AMATEUR EQUIPMENT

We've been very busy sending out catalogues for our new range of Amateur Transmitters and Kits, and consider the response to be very encouraging.

Further to this, we'd like you to note that everyone who has received a catalogue is on the mailing list for additions, and alterations, and will receive these as a matter of course.

Now to business: here is a price list for some of our present range of equipment:

TX150 Transmitter Kit .. £60/4/6  
As above, less VFO .... £49/8/6  
TX75A Transmitter Kit .. £51/3/9  
As above, less VFO .... £40/7/9  
TX75B Transmitter Kit .. £53/8/9  
As above, less VFO .... £42/3/2

Complete set sheet metal for TX150/75, including knobs, printed front panel, rubber feet, etc. £15/6/0

Cabinet and Chassis complete, but undrilled .... £10/2/2  
P.A. Cage, suit any final, perforated steel, plated £1/8/10

For full details of these and other equipment, send now for our free descriptive catalogue.

## NEW EQUIPMENT— THE "UNIMOD"

A universal modulator for any transmitter using single or parallel 6146, 807 or 1625 tubes in the P.A., and suitable for use with many other final amplifiers with similar characteristics.

For use with a crystal microphone, the "Unimod" produces constant high level modulation without splatter.

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We would like to draw members' attention to the fact that VK2 c.w. number are NOT issued at the time of joining the Division, unless a covering letter requesting a number is included with the application.

Next month we hope to devote this space to details of members' gear and activities, if such information is forthcoming from you chaps.—Doug L2215.

### BOORAGU HIGH SCHOOL RADIO CLUB

Good news first, Ian Forrest, a senior member of our club, has received his 21st call sign, 2AJF. I know he would appreciate a call, so if you hear him please give him a shout.

On Friday, 11th August, Bob 2IN organised an Education Week hook-up in which the school station and several others took part. Those in the net were from Queensland, Victoria and the clergy and the club members of N.S.W. We were fortunate that conditions were good and we all had a good time. Sue Saunders and Ian McKinnon represented Booragui and the radio club members did the "studio" management.

The club has been promised some more equipment by the W.I.A. Disposal Committee and you may be sure that it will be put to good use. 73, Bruce, for 2ATZ.

### ALBURY RADIO CLUB

Recently the club took in several new members, all of whom are exhibiting keen interest in club activities. On June 9 the W.I.A. Correspondence Course was begun under the tutelage of Don 2RS, and the club hopes to prepare these fellows for their licence by early 1962. More practice is also available to them each night.

Meetings of the club are at present being held in Don's shack and contacts on the bands are frequently made on meeting nights. Geoff Amy recently received news of passing the examination for his Limited licence, but no call sign allocated as yet. At the present time Geoff is busily engaged building his rx. The office-bearers of the club are: President, Herb 2QD; Secretary, Don 2RS; Treasurer, Alf Bullock.

## VICTORIA

Because the Radio Theatre is not available during term vacations, the September meeting was held a week earlier than usual. Perhaps this may be the reason for the attendance, however those who did come heard a very informative lecture by Jack 3VZ on the art, science and trickery of 80 m. tx. Jack 3VZ. After covering the technical and practical aspects of loop construction, sense indication, "sniffers" and rx requirements, Jack, with the assistance of the other hunters present, reminisced about some of the outstanding hunts of recent years. There was the baby in the gram tin, the bird in the river near Wandrye fiasco, and many others culminating in the microwave tx swindle perpetrated by the lecturer himself at the last outing.

Pieces of equipment on display were described by their proud owners. David 3ADW, Alf 3IE, Michael 3CZC, Michael 3ZEO, Keith 3RQ and Jack himself. Syd 3ASC drew maps with unsuspected skill. Judging by the questions asked and the notes taken, there will be some new starters in future. Jack pointed out that this sport does not require a licence except for the one who hides the tx, therefore associate members may take part. It is not necessary to have a car, an 80 m. tx, a converter for the car radio, or a Command rx and the nominal amount of team immunity you can enjoy is a plus. Amateur Radio which is quite different from the usual activities and take the family for a social outing at well. This talk was interesting and not a little amusing. Thanks Jack and all who helped.

The President welcomed Rolf Haggleman, an ex-2XH who is now living at Altona and operates mainly on 7 Mc. c.w. with the call 3AOF. At the next meeting on the first Wednesday in October, Geoff 2AHN will give a talk with the intriguing title "The Other Side of Photography." He will also screen two films, one concerning the high speed photography used to study rapid movement such as relay contact bounce and picture tube implosions, and the other about lens manufacture. Many Amateurs are also involved in photography and during these days so come along to the Radio Theatre, Royal Melbourne Institute of Technology to hear George's lecture. It will be good.—3AEI.

### SOUTH WESTERN ZONE

Conditions have been in and out over the last few weeks; having received no notice of the results of the 1961 contest, one strange signal heard on 7 Mc. band signing 3NA in

QSO with 3FX, also heard Dr. later giving the c.w. a go, not so long ago Dr. was telling me he was too busy this time to put up a bit. John 3AGD and Kevin 3AKR have been over to VK6 for a conference on Bush Fire Radio. Their portables but have not heard how they went.

This looks like stealing David's thunder, but could anybody tell me why the 2 m. stations in the scramble came to a halt at 2100 hours at 2015? It sounds as if the Iron Curtain rises at 1945 and comes down as soon as the scramble is over the other clubs, VK4, VK5, 3UT, but before and after silence reigns supreme—and how!

Things are very lively here with two new stations on the band—Wally 3UT and Lindsay 3ZKL, a new Ham. Welcome to the ranks Lindsay, your modulation really shows some of the older clubs, VK4, VK5, 3UT, the triode king, after telling us all about the wasted power by using screens in a tube, tell me all and sundry by using the 3UT in the final, running 10 watts, as the 3UT in the 6 m. tx rig. Wally, what a waste of power, why not try a 7153 and leave the wasteful tube to the no-hoppers.

Congrats, go to Bill 3ZFG who will have lost the Z with a brand new call he is waiting for. T.V. just about covered him here with the 2 m. tx rig, 80w, get that 8 Mc. rock off the fundamental and make it overtone—easy when you know how. All I want now is a few beams south west—73, 3ANQ.

### MOORABBIN AND DISTRICT RADIO CLUB

Since last writing notes for A.M. final arrangements have been made for the Club to operate portable under their call sign of 3ACP/P on the week-end of October 21 and 22 at Clifford Park, near Croydon, Vic., in connection with the Scouts Jamboree-on-the-Air.

20, 40 and 80 m. as well as 2 m. operation will be attempted and we would be very pleased to have all Amateurs as possible throughout Australia to contact us. The week-end, twenty and 80 m. will be operated back to back in a marquee near the scene of most of the Scout activities, and will be manned by Bob 3NZ, Arthur 3AWO, Ken 3ACS and other members. Forty and 2 m. operation is envisaged in a high knoll on the grounds where the arch was erected for the late World Jamboree a little further away from general activities, and will be manned by T.V. 3AC, Harold 3AC, and a number of other members. It will be interesting to see how we set out on 2 m. and I must urge the Scouts to point us to the marquee towards Croydon. Operation will commence on Saturday morning and go through until Sunday afternoon, that is, Sat. Oct. 21 and Sunday Oct. 22.

As well as the Jamboree-on-the-Air, this gathering at Clifford Park, where there will be about 500 Scouts, is also designated "The Melbourne Gathering" and is a yearly affair. The Scouts compete among themselves and are taught many interesting Scout-like phenomena such as canoeing, archery, rock climbing, first aid, and this year a special obstacle event is being staged. Look out for 3ACP/Portable boys! 73, 3LC.

## QUEENSLAND

How did you get on in the R.D. Contest? I hope you forwarded your qualifying letter to do the right thing for your Division. The most interesting item I have to report is that on Friday, 11th August, 1961, 12 members meeting at my QTH for the usual monthly meeting. Quite a lot of business was handled and one of these days I'll be able to report that all business was completed. Secretary Bill 4WS has a growing pile of correspondence (we have obtained for him a nice set of scales) which would have taken most of the night to read completely and which was dealt with. Treasurer Keith 4DG had his eagle about, roving about, but no money was game to show any money. Keith is going to be the tightest treasurer I've known for some time.

Council approved "Ionospheric Predictions for the Year 1961-2" and "The International Radio Propagation and Recent Research" for November, so arrangements will be completed for the next month.

There is a proposal afoot to dispose of equipment that is not earning its keep in order to buy equipment that could be used by country branches. This will not be done, as the money so don't start rushing. Discussion took place on "QTC" and by now you will have seen some of the results. Our money is being posted but further improvements may result. In its new form, "QTC" has been accepted for bulk postage registration by the P.M.G. Some of Royal, prospects are being considered, so moving out soon. A quotation for QSL







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O-12

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of any great importance came out of either Federal or general business, although a couple of volunteers were roped in to the Disposals Committee, in the persons of Gil 5GX and Hubby 5LW. The latter, however, was recruited by George 5RX, who reminded those who heard him above the din of conversation that the "Smoko" was the only time when they received their full calls should let him know their new call signs as he was holding quite a number of cards for these chaps because he was "Smoko"ing.

"Smoko" was then announced and this gave everybody an opportunity to examine more closely the array of exhibits on the table at the foot of the podium, where, standing as exact, at the feet of the chairman, John 5KX. I have to slip him in somehow, must keep him out of the picture. The judge at court is not to be sneered at. Some of the things they say about me at Council meetings don't bear repeating. During this closer examination of the gear on display, an inevitable clock spinner and dial twister came into his own and only restrained in his efforts by a suggestion that he cut it out, or else, and from then on a number of these addicts walked around with their hands behind their backs, in a look of offended innocence on their own dials.

At this point members returned to their seats (those who were quick enough to find them) and the panel of judges, who were to make the awards, after each exhibitor had described his own particular piece of gear, began to deliberate. The first award, for the afore-mentioned panel of judges (who must remain nameless for their own safety) finally decided on the award winners who were: 1st. Listowel, for the 50 Mc. mobile, by Frank Forgie with a rx for mobile use; the Full Member section went to Cyril 5DY for continuing the best station in the 50 Mc. section to Bob 5ZFC for a 50 Mc. tx. To the winners, and the losers, go the congratulations. The award ceremony was a most interesting effort toward making the monthly general meeting such a successful and entertaining evening.

Sat. across the aisle from Leth 5LG at the meeting and he was having the time of his life carrying on an argument with himself about the need to go to the "Smoko" through the air." Whilst I cannot remember having to dodge any chairs, I must admit that the meetings today are much quieter than they used to be. I am sure that I can remember being openly insulted for some years!

Our general Secretary, Pat 5US, brought down the house when he announced that among the prizes for the month of October was a public telephone booth which could make a splendid shack for someone. I waited in anticipation for the name of the lucky person. The figure was what he had in mind, but although he has only been on Council for a couple of months he has already absorbed their technique and simply leered at me.

However John 5JC unconsciously paid me a compliment when he told members that the conditions of my sell were not to be altered, and the auctioneer would stand in a narrow opening on the stage and handle the bids. "Get up there early," he was saying, "and you'll be in a fix to have a friend at court. I'll bet he is tearing up brown paper in a frenzy of rage at his unconscious wifey and you'll be in a fix to get her here, he would thank you also. Excuse my girlish rhapsody."

The Division has two means of announcing the week-end duty roster for all keen and interested W.I.C.E.N. members, the 5WI section, headed by Keith 5WI and the paper column headed by myself. Keith 5WI are tremendously impressed by the painstaking manner that all W.I.C.E.N. members are reading and listening to the Division. The fact we would be overcome with our importance to the Division if we had not discovered that the Division has been so well served as to members being on duty in excess of those of that week-end, speaks volumes for the Division and the members who are so ready to members, to say nothing of the relief to Keith and myself. Ho hum!

The 5WI call-back session was recently held Bert 5Z5 of Port Pirie. An extra good signal, so much so that all who heard it were commenting on the fact, and Bert was so pleased with the result that he will be looking forward to his weekly participation in the call-back.

At the 10th of October a number of the regulars were intrigued to hear Len 6LG bob

up the other Sunday and exchange greetings. Nice to hear you OM, and your signal when you first called was extra good although you had taken a bit of a dive when you eventually took the air.

Reg 5RR hits the news this month for two reasons. Firstly, because of the many appreciative reports that come from the centres regarding his 80 mc Sunday morning re-broadcast of 5WI, and secondly, for the fact that he became a granddaddy for the first time. It was a most interesting and mainly out of consideration for the visitors' ears I am told, but he is up and about now, and ready to see him up and about now, if you don't, you will find the conversation being tactfully led round to his grandson Peter. Congratulations Reg, although you can't take all the credit!

Talking about the 5WI re-broadcasting, I see that Tom 5A4 is handling the 14 Mc. side of this excellent set-up for the outlying members. Have heard him faintly at times, but as he is using, more often than not, the gospel according to Comps 5EP I leave him by with only the barest note of recognition!

Lenace 5XL has apparently given his set-up an injection of monkey glands or something, because he has been heard in various places. It is getting monotonous to hear the comments from all that hear him. What's the use of Lenace 5XL? He has been heard bobbed up again on the 5WI call-back and sounded in good form, although he admitted that he still isn't as easy. Nice to hear you, Buck, good signal, too.

Had my usual sticky back session this week into the weekly send off between Rex 5DO and Bob 5US, and I was surprised to hear a word which sounded like "barrow" come out of concrete into the shack and dump it on the shack table. Hurriedly grabbing my pencil in contemplation of the best statement ever made by Rex, I was completely deflated to hear him say, "Thank you for the cup of tea sweetened with sugar." I was so surprised that my phones never sound as they seem. Oh, by the way, that 5YL who refused to talk to one of her contacts because "that horrid old Pansy might hear him" is still in the game. I know that I was. Also I am not old! (Only in experience.—Ed.)

Bert 5WC came the other Sunday morning in contact with Keith 5WI giving what was apparently the local weather report. According to the 5WI section, the report was not very good although it did not seem to be affecting his signal in any way. Did a good job in the R.D. contest Bernie? No doubt about you, Brian 5EM was heard in the 5WI section, giving for assistance on 288 Mc. to extricate his car which was down to the axles in mud. Despite a road block to prevent any help, somebody eventually got through, and all is well.

Was walking down Pirie Street the other morning and my way was somewhat strained to see Rex 5KY pushing a wheelchair in which was seated a bent-up, mis-shapen man of humanity, which to me appeared to be on the brink of losing his mind. To my surprise, however, just as they almost came level with me, to see the afore-mentioned man, in a wheelchair, being pushed by a man in a chair, thank Rex for the ride, and then dashed madly up the street at a speed which would have made my mind melt. I was surprised to see Dear oh dear, what some people won't do to get a mention in this column.

Gil 5SX is a new Council member for VK5, replacing George 5QG who was elected owing to pressure of business. Gil, so I am informed, is a school teacher, a very keen v.h.f. man, plus being active on the "square" bands, and has also been heard in the Division activities. All of this naturally adds to the fact that he appears to be good Council material, although he could be a bit of a "square" in my black book alongside all the other Council names. Joking aside, Gil, welcome to the executive committee. May your lights burn long and bright.

Carl 5SS, Frank 5MZ and their mate Skippy called on the Baronial Hall of Luke 5LL the other Sunday and had a most interesting session of conversation. Having seen the speed at which Frank dashed inside at the mere mention of the word "Smoko", I was surprised to see now just why he breaks legs and arms, etc., etc., with reckless abandon. If there had been anybody in the road he would have gone right over it and into the next.

My espionage agent from the S.E. of VK5 came to light this month with some notes on the 5WI call-back which I have just taken. I took his role of spy so seriously that in an

endeavour to keep the whole matter secret and hush hush, he forgot to sign his name. However, I think that I know who it was, and my thanks go out to him.

Claude 5RC is still on the air at last and is very happy with the results. It has been a long time but worth it, although I am sure that he will be able to tell you how he has heard it. What about it Claude? Stuart 5MS has built a new modulator and has been having him trouble. No doubt are these notes on the 5WI call-back, but I am sure he has departed into the limbo of forgotten things. Blime! Did I write that, I am becoming a bit of a seer. I am sure that the prevailing DX on 40 mc with his well-known brand of c.w. Unless my memory serves me right, the glowing DX on the 5WI call-back and Amateur Radio should begin to ease off. Am I right, Erg?

Leo 5GT according to reliable reports is in the States, still settling up an A.R.D. with success. Ron 5VH is in the land of the missing at the moment of writing, but should bob up again at any time longer for the fray. The South East is one of the areas that report appreciatively on the reception of the 80 mc re-broadcast. I take a bow again Grandpa. Dave 5AW and Penola 5W are on the 7 Mc. and according to information received has his gear in working order from 80 mc and down to 10 mc. I am sure that he will be a matter of fact, any time that I listen on 40 mc and cannot hear his signal at some time or other, I will be sure to hear him.

Col 5CJ has been keeping his schedules with Pete 5FM, but apart from this can be almost classed in the inactive group. Settled down in the States, Col 5CJ has been in the States for so long that I can only say that I knew you when! Graeme 5VH and Col 5XY heard in nightly schedules on the 7 Mc. band this month. Col was portable some time through the 7 Mc. band. Graeme was at his home QTH, judging by the strength of his signals. Two-way copy was made and really, the position of Col's in the crowded 7 Mc. band. Bob 5NW heard in contact with 3AGD mobile near Remark and heard 3AGD gather from the various stations on 3AGD for the purpose of VK3s of VK3s were on their way to a gathering of E.F.S. somewhere in VK6. Don't know if you will hear all the interesting details. I went for cover, a party of VK3s loose in our city of churches would be too much for me. I was in the 7 Mc. band, mobile out near the Mount Gambier aerodrome. He was on his way to Penola and judging by the stations calling him at various times, his signal was very good. I am sure that I myself heard a VK6, a VK7, a VK4, and a VK5 calling him, to say nothing of sundry VK3s.

No further information on the forthcoming Elizabeth Radio Club participation in the 5WI section. I am sure that they will have it on good authority that at the moment of writing Ron 5FY is on a visit to the wilds of VK2 and upon his return a waiting word will hear all the interesting details.

Had my annual contact in the R.D. Contest with Alan 4PS and I seemed to detect a shade less embarrassment in his voice as he called me. I am sure that he will be able to tell you that he was in the 7 Mc. band, mobile out near the Mount Gambier aerodrome. He was on his way to Penola and judging by the stations calling him at various times, his signal was very good. I am sure that I myself heard a VK6, a VK7, a VK4, and a VK5 calling him, to say nothing of sundry VK3s.

Bill 5WV heard on 7 Mc. in contact with a VK3. It is a long time since I have heard him. I am sure that he will be able to tell you that he was in the 7 Mc. band, mobile out near the Mount Gambier aerodrome. He was on his way to Penola and judging by the stations calling him at various times, his signal was very good. I am sure that I myself heard a VK6, a VK7, a VK4, and a VK5 calling him, to say nothing of sundry VK3s.

If I am not out of my mind, I must confess to being mystified, with my army of spies and agents I can usually get the answer to most things in the world of Amateur Radio, but I am sure that he will be able to tell you that he was in the 7 Mc. band, mobile out near the Mount Gambier aerodrome. He was on his way to Penola and judging by the stations calling him at various times, his signal was very good. I am sure that I myself heard a VK6, a VK7, a VK4, and a VK5 calling him, to say nothing of sundry VK3s.

In closing the notes for this month, I must refer, with a touch of bitterness, to the state of affairs in the 5WI section. I am sure that he will be able to tell you that he was in the 7 Mc. band, mobile out near the Mount Gambier aerodrome. He was on his way to Penola and judging by the stations calling him at various times, his signal was very good. I am sure that I myself heard a VK6, a VK7, a VK4, and a VK5 calling him, to say nothing of sundry VK3s.

## WESTERN AUSTRALIA

Well the most important month of the year has passed and much activity was listened to in the R.D. Contest. What a crowded section of the spectrum during the 24-hour period and what a pity the little more of the same activity is not heard at other times. However, considering the conditions on the high frequency bands there were a few who were certainly fortunate with the excellent openings on all bands between VK6 and the other sides. Now we patiently wait for results and post mortems.

The monthly meeting was held on 15th Aug at the usual place and was well attended. Heard a lot of regular visitors and a metropolitan member also should put his name in the visitor's column. Nice going Herbie. After business was concluded, GAG gave his long-postponed lecture on "Glass" and its hows and whys. It was well worth waiting for Wally and many of us were much wiser when you finished. The meeting concluded with an auction sale of equipment belonging to 6WH. This was ably conducted by 6JK and bidding was quite animated although some members hesitated to bid and how the bidding went, with the help of 6KW, most members carried something home.

Activity on 40 m was enlivened during the month by the invasion of VK6 by some ten VKs who prowled around the country with mobile gear, no doubt trying to learn the secret of the long and short signals sent from 6AG, 6CL, 6KJ, 6LG and others. By the way, since he has become a gentleman of leisure, 6LG has been giving me a lot of help, giving much helpful advice to new members in his own whimsical way.

6RG is gradually overcoming his t.v. problems and also DXing very successfully on the higher bands. Heard Bob and GAG having a discussion one night on t.v. It would have made a good tape for the benefit of others, especially with comments from 6WL added. These boys certainly have their problems.

Many strange noises are heard here on the t.v. bands, but the benefit of others interested in s.b. However, most of them are not hard to resolve even on my over-worked ARB. Perhaps some of the signals heard are just something to fill the bands myself. There are seldom more than the same five or six on 80 m at night, although there are plenty of stations on 40 m and 30 m and some of them had at present. However, with so many new call signs due on the bands, it may improve, or at least be somewhat more interesting in regard to t.v. Some of our most consistent operators are between a hundred and two hundred miles from Perth and this is considered a considerable distance. The only direction there are no t.v. problems at present is due west. 6WL at Bunbury is one call sign missing on 80 m, he is about 100 miles, approximately 150 miles south of the t.v. tx. Of course any interference must be caused by his being on the air. I wonder if 6ZL could give him any hints?

Well chaps, enough for this month as we must leave some space for 6PS with his comments and also make room for the results of their VK6 tour—73, 6ZCK per 6LS.

— . . . —

## TASMANIA

The R.D. Contest is over for this year, bar the shouting and the checking of logs. Some observations can be made at this time. However, first, there were fewer VK7 stations than in part this year, probably about 46 to the best of my knowledge. Secondly, the average of the six highest logs from the State was not as high as formerly. Thirdly, and this is a good point, the c.w. section was very well patronised by our members. Fourthly, congratulations to David TMS for his first state. Fifthly, in my opinion, VK2 is the State to issue a real challenge to us, their effort was commendable on 80 m. 6Q should have encouraged us with his great effort. Seventhly, the effort from VK3 appeared to be most disappointing in his position. Finally, the results of the Contest. We would like to see more participation from that Division, even though they are only one point per contact for us. Congrats to 7EB ex-2XAU. Ted obtained

his full licence early in August and has been heard, particularly on the 30 m band.

Although I am writing this in the Hobbies Exhibition has taken place, I want to thank all the helpers for their invaluable assistance in making the exhibition established and operating. Although I cannot mention every one who took part, yet I want to thank publicly, not necessarily in order of merit, Michael 7ZAY who spent his holidays to wait upon the exhibit throughout the duration of the exhibition, to Terry 7CT for the loan of his 100 m. B. 220 V. transformer, and his v.h.f. rig, to Ken 7KA for the loan of his National rig, and to many others I cannot name, for instance for the loan of antenna mast.

Jack 7JB is at present constructing a "small" rig, with an 607 in the final, to run about 60w. Jack describes this rig as a semi-portable, and it is designed for operation during the Jamboree-on-the-Air on 21st and 22nd October. Jack intends to use this rig upon completion while he reconstructs his big rig and t.v. proofs same.

While on the subject of the Jamboree, remember to take part by having Scouts at your station, give the boys the chance to talk to others of their way of thinking—it is great fun. Also, remember the social function at Infield, beginning at 7.30 p.m. on the 21st. The admission £1 per head, profits to go to the fund raising committee for our projected club house.

Bob 7OM is on the air to a much greater extent these days. He tells me things have eased off a bit at work, so it is good to hear you are back on the air again. I have heard about the middle of August, namely, 7TD, with ample speech clipping. How about repeating the dose Tiny? 73, 7ZL.

## NORTH WESTERN ZONE

News is rather scarce this month with the usual sporadic activity. Our September zone meeting was fairly well attended. A second helping of a lecture on s.b. was given by Ken 7AI, who certainly knows his subject.

Quite a number of members were present, for fear that we said something silly, but I feel sure we gained some real knowledge and enjoyed it with a vengeance. 7AI again showed a fine turn of skill in the role of auctioneer and some classic examples of junk chased hands.

Spent a couple of interesting evenings with 7KS last month. Quite an experience to work familiar voices from a new rig. It's happened at last—David 7M and I have been on the air and the rig had to be shut down during the recuperation period. There is a lesson to be learned somewhere here. Saw a couple of the boys at the end of the month, and they had a sudden windstorm that swept across us the other night. They were rubbing their hands, counting the number of times they were blown down. Wonder why? Sam 7SM is still collecting rare DX. I am sure his how many countries? I am sure it would be rather surprising.

This Zone has been asked to support a Hobbies Exhibition at Devonport in November with a 20m. This is most commendable and to show off our paces, so rally round chaps. Associate Bob Simpson sold us the idea. He doesn't know what it is going to cost him though.

Athol 7LR, a call sign familiar pre-war, is talking of making a come-back to the bands—more on 20m. There is much competition in this area in 80 m signal reports from ZL. Have been forced to install a secret weapon to maintain prestige. Even got to stage where competitors believe I have the secret answers; hi. Has anybody a recipe for bringing a Tasmanian tiger out of hibernation. If we go we go, but I have been discussing to do some horrible things to Ham Radio. Everywhere one sees Hams busy selling them, repairing them, building them or watching them with their hands on their hips, no alternative. And it's happened here—a pity.

Finally, it's a small world. Met XYL 3KU in southern corner of Tassie the other day. Often heard she finally said, So off and clear until next month. 73, 7MX.

## NORTHERN ZONE

During a recent visit to Hobart I was asked if the northern zone was as busy as they say a few notes would not be amiss and would let the rest of the gang know what we are doing. Twelve members and one prospective member attended the meeting. The meeting was held at the QTH of yours truly (7ZB) at 11 Mayne St. Launceston. The usual business was attended to, and a discussion was requested to have a go in the R.D. Contest. Den 7DK has power troubles and is operating on 7L at present (still seems to get out OK). Col 7LZ brought along a transistor tape re-

order for our inspection and it replayed a portion of the meeting with Max 7CA at the controls. Very nice but the 30 db. is a bit high for most of us. After the meeting all adjourned to the shack to inspect the partially completed 2 m rig that I hope to get on the air shortly. Later members were shown some color slides taken on a recent visit to Hobart.

The evening concluded with supper as usual. Last month there was a fair amount of activity on 144 Mc. with 7ZBE and 7ZAI, who were located at Kelson, Northern Tas., on regular scheduled with L'lon. Also Peter 7PF portable 2 m using a 5 el. beam at Evandale contacted 7ZAO at Lenah Valley, Hobart, and was heard at 58 for about 10 minutes, and has received QSL card confirmation. 73, 7ZB.

## HAMADS

Minimum 5/- for thirty words.

Extra words, 2d. each.

Advertisements under this heading will only be accepted from Institute Members who desire to accept of equipment which is their own personal property. Copy must be received at P.O. Box 38, East Melbourne, C2, Vic., by 8th of the month, and confirmation will be sent by advertisement. Call signs are now permitted in Hamads. Dealers' advertisements not accepted in this column.

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**FOR SALE:** One set of eight used Bamboo Poles for Quad Antenna. £3 ex Croydon or plus freight. A. Roudie VK3UJ, Croydon Way, Croydon. Phone (bus. hrs.) 69-1159.

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is the official journal of the Wireless Institute of Australia and was first issued on 1st October, 1933, by authority of the Council of the Victorian Division, the present publishers.

The Wireless Institute of Australia was founded in 1910 to promote interest in Amateur Radio; today each State has its own Division which is responsible for intrastate matters. Each elects a member to Federal Council who delegates to Federal Executive the task of implementing their decisions on Interstate matters. The Federal Executive is nominated by Victorian Division and these nominations are ratified by all Divisions.

Any person with an interest in Amateur Radio or Short Wave Listening may join the W.I.A. It is not necessary to possess an Amateur transmitting licence. Enquiries for membership should be made to the Secretary of the appropriate Division. Various affiliated clubs are in operation and transmitter hunts, s.w.l. meetings, v.h.f. groups and scrambles, etc., all form part of their activities, full details of which may be obtained upon application. All financial members of the W.I.A. regularly receive a copy of "A.R.", the cost of which is included in the membership fee.

The W.I.A. is a non commercial society with honorary office-bearers. Every Sunday the Divisions make official broadcasts from their WI transmitters and these sessions are designed to bring to all interested parties the news and views of that Division. Scheduled broadcast times are given below.

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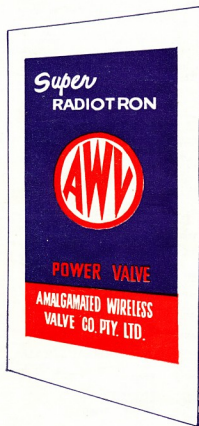
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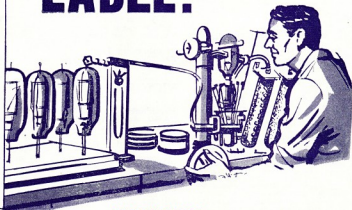
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